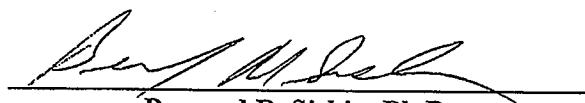**EXHIBIT 3**

REPORT

in the matter of

United States of America v. City of New York

by

Bernard R. Siskin, Ph.D.
Director and Head of Labor Practice Group

LECG
Philadelphia PA

November 2007

REPORT
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Bernard R. Siskin, Ph.D.

I.   INTRODUCTION

I am a Director and Head of the Labor Practice Unit of LECG, LLC. I work out of the Philadelphia, Pennsylvania office. I received my Ph.D. in Statistics with a minor in Econometrics from the Wharton School of the University of Pennsylvania in 1970. I have authored four books on statistical methodology, three book chapters (including one in a book entitled *Employment Discrimination Litigation: Behavioral, Quantitative and Legal Perspectives*), four research monographs, and numerous papers, including articles on the role of statistics in the analysis of employment discrimination issues. Since receiving my Ph.D., I have specialized in the application of statistics to the analysis of employment practices. In this capacity, I have been retained by numerous governmental and private organizations including, but not limited to, the Third Circuit Task Force on Race and Gender, the Equal Employment Opportunity Commission, the United States Justice Department, the Office of Federal Contract Compliance Programs, the Federal Bureau of Investigation, and various states and municipalities as well as numerous Fortune 500 Companies and other private corporations. My resume is attached as Appendix A.

I have been retained by the United States Department of Justice in connection with *United States v. City of New York*. I am currently being compensated at a rate of $375 per hour for my time.

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I have been asked: (A) whether the use by the City of New York ("City") of Written Exam 7029 on a pass/fail basis with a cutoff score of 84.705 had a disparate impact upon African-American or Hispanic candidates for the position of entry-level firefighter in the FDNY;[1] (B) whether the City's rank-order processing/selection of those who passed Written Exam 7029 and the City's physical performance test ("PPT") had a disparate impact upon African Americans or Hispanics; (C) whether the City's use of Written Exam 2043 on a pass/fail basis with a cutoff score of 70 had a disparate impact upon African-American or Hispanic candidates for the position of entry-level firefighter; (D) to quantify the impact upon African Americans and Hispanics of the City's use of Written Exam 2043 at the "effective cutoff"; and (E) whether the City's rank-order processing/selection of those who passed Written Exam 2043 and the PPT had a disparate impact upon African Americans or Hispanics.

II.   SUMMARY OF PRINCIPAL CONCLUSIONS

A.   The City's Pass/Fail Use of Written Exam 7029 with a Cutoff Score of 84.705 Resulted in a Disparate Impact upon Both African-American and Hispanic Candidates

- The City's pass/fail use of Written Exam 7029 with a cutoff score of 84.705 has

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[1]   Based on the documents provided to me, I understand that an open competitive examination process for the entry-level firefighter position in the City's Fire Department ("FDNY") consists of several steps, including a written examination and a physical performance test, and that the City refers to the whole process as an "Examination." The open competitive examination processes at issue are Examination No. 7029 ("Exam 7029") and Examination No. 2043 ("Exam 2043"). Consistent with the parties' practice in this case, I refer to the written examinations used as part of Exams 7029 and 2043 separately as "Written Exam 7029" and "Written Exam 2043," respectively, although I understand that the City has stated that the two written examinations are "alternate forms" of the same examination and are "substantively identical." *See* Rule 30(b)(6) Deposition Testimony of the City (T. Patitucci, designee), p. 192; Letter from G. Pestana to E. Yorke, dated January 9, 2004. As used in this report, a "candidate" is an individual who took Written Exam 7029 or Written Exam 2043.

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resulted in a statistically significant disparate impact upon African-American candidates for the position of entry-level firefighter in the FDNY. The disparity between the pass rate of African-American candidates and the pass rate of white candidates is equivalent to 33.9 units of standard deviation.

- The City's pass/fail use of Written Exam 7029 also has resulted in a statistically significant disparate impact upon Hispanic candidates for the position of entry-level firefighter in the FDNY. The disparity between the pass rates of Hispanic and white candidates is equivalent to 17.41 units of standard deviation.

- In practical terms, the effect of the disparate impact of the City's pass/fail use of Written Exam 7029 upon African Americans was to eliminate 519 African-American candidates from any possibility of appointment as entry-level firefighters in the FDNY. In other words, had the City's pass/fail use of Written Exam 7029 not had a disparate impact, 519 (74.7%) of the African Americans who failed Written Exam 7029 would have passed it, and an estimated 114 more African Americans would have been appointed as firefighters. The pass rate of African-American candidates on Written Exam 7029 was 67.0% of the pass rate of white candidates.

- In practical terms, the effect of the disparate impact of the City's pass/fail use of Written Exam 7029 upon Hispanics was to eliminate 282 Hispanic candidates from any possibility of appointment as entry-level firefighters in the FDNY. Had the City's pass/fail use of Written Exam 7029 not had a disparate impact, 282 (56.9%) of the Hispanics who failed Written Exam 7029 would have passed it, and an estimated 62 more Hispanics would have been appointed as firefighters. The pass

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rate of Hispanic candidates on Written Exam 7029 was 85.3% of the pass rate of white candidates.

B.   The City's Rank-Order Processing/Selection of Candidates from the Exam 7029 Eligibility List Resulted in a Disparate Impact upon Both African Americans and Hispanics

- African Americans who passed both Written Exam 7029 and the PPT were ranked statistically significantly lower on the eligibility list for Exam 7029 than whites. The disparity in ranks between African Americans and whites is equivalent to 6.48 units of standard deviation.

- Hispanics who passed both Written Exam 7029 and the PPT were ranked statistically significantly lower on the eligibility list for Exam 7029 than whites. The disparity in ranks between Hispanics and whites is equivalent to 4.57 units of standard deviation.

- In practical terms, the effect of the disparate impact upon African Americans of the City's rank-order processing/selection from the Exam 7029 eligibility list was that, on average, African Americans were delayed in being reached on the eligibility list and, hence, were delayed in being appointed. The delay resulted in a loss of wages and seniority for 68 African-American firefighters appointed from Exam 7029. These 68 African-American firefighters lost a total of approximately 20 years of employment. On average, each of the 68 lost about 3 1/2 months of wages and seniority due to the disparate impact of the rank-order selection process.

- In practical terms, the effect of the disparate impact upon Hispanics of the City's rank-order processing/selection from the Exam 7029 eligibility list was that, on

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average, Hispanics were delayed in being reached on the eligibility list and, hence, were delayed in being appointed. The delay resulted in a loss of wages and seniority for 86 Hispanic firefighters appointed from Exam 7029. These 86 Hispanic firefighters lost a total of approximately 23 years and 1 month of employment. On average, each of the 86 lost more than 3 months of wages and seniority due to the disparate impact of the rank-order selection process.

C.   The City's Pass/Fail Use of Written Exam 2043 with a Cutoff Score of 70 Has Resulted in a Disparate Impact upon Both African-American and Hispanic Candidates

• The City's pass/fail use of Written Exam 2043 with a cutoff score of 70 has resulted in a statistically significant disparate impact upon African-American candidates for the position of entry-level firefighter in the FDNY. The disparity between the pass rates of African-American and white candidates is equivalent to 21.84 units of standard deviation.

• The City's pass/fail use of Written Exam 2043 with a cutoff score of 70 has resulted in a statistically significant disparate impact upon Hispanic candidates for the position of entry-level firefighter in the FDNY. The disparity between the pass rates of Hispanic and white candidates is equivalent to 10.46 units of standard deviation.

• In practical terms, the effect of the disparate impact of the City's pass/fail use of Written Exam 2043 upon African Americans was to eliminate 165 African-American candidates from any possibility of appointment. Had the City's pass/fail use of Written Exam 2043 not had a disparate impact, 165 (81.3%) of the African Americans who failed Written Exam 2043 would have passed it, and an estimated 30 of them

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would have been appointed as firefighters to date. The pass rate of African-American candidates on Written Exam 2043 was 87.8% of the pass rate of white candidates.

● In practical terms, the effect of the disparate impact of the City's pass/fail use of Written Exam 2043 upon Hispanics was to eliminate 94 Hispanic candidates from any possibility of appointment. Had the City's pass/fail use of Written Exam 2043 not had a disparate impact, 94 (61.8%) of the Hispanics who failed Written Exam 2043 would have passed it, and an estimated 17 of them would have been appointed as firefighters to date. The pass rate of Hispanic candidates on Written Exam 2043 was 95.5% of the pass rate of white candidates.

D.   Both African-American and Hispanic Candidates Disproportionately "Failed" Written Exam 2043 at the "Effective" Cutoff Score

● Because the City has used Written Exam 2043 on both a pass/fail basis and (in combination with PPT scores) for rank-order processing/selection and has not exhausted the Exam 2043 eligibility list, evaluating the disparate impact of the City's use of Written Exam 2043 based on a cutoff score of 70 understates the true effect of the written examination upon African-American and Hispanic candidates. Given the City's methodology for assigning ranks on the 2043 eligibility list based on combined written examination and PPT scores, even candidates who scored above 70 on Written Exam 2043 may not have scored high enough to be considered for appointment, regardless of their scores on the PPT. Such candidates have "effectively failed" the written examination. The differences between the effective pass rates of African-American and white candidates, and Hispanic and white candidates, on Written Exam

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2043 are statistically significant, equivalent to 21.89 and 10.52 units of standard deviation, respectively.

- In practical terms, the disparate impact of Written Exam 2043 has effectively eliminated 401 African-American candidates and 242 Hispanic candidates from any possibility of appointment. Had African-American, Hispanic and white candidates been equally likely to effectively pass Written Exam 2043, an estimated 70 additional African Americans and 45 additional Hispanics would have been appointed as firefighters to date. The effective pass rate of African-American candidates on Written Exam 2043 is 59.0% of the effective pass rate of white candidates. The effective pass rate of Hispanic candidates is 83.8% of the effective pass rate of white candidates.

E.   The City's Rank-Order Processing/Selection of Candidates Based on a Combination of Their Scores on Written Exam 2043 and the PPT Resulted in a Disparate Impact upon Both African-American and Hispanic Candidates

- African-American candidates were ranked statistically significantly lower than white candidates on the eligibility list for Exam 2043. The disparity in ranks is equivalent to 9.45 units of standard deviation.

- The City's rank-order processing/selection from among candidates on the Exam 2043 eligibility list has had a statistically significant disparate impact upon African Americans in terms of appointments, disproportionately eliminating them from any possibility of appointment to date. The disparity between the rates at which African-American candidates and white candidates on the eligibility list have been reached for possible appointment is statistically significant, equivalent to 9.74

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units of standard deviation.

- Hispanic candidates also were ranked statistically significantly lower than white candidates on the eligibility list for Exam 2043. The disparity in ranks is equivalent to 4.55 units of standard deviation.

- The City's rank-order processing/selection from among candidates on the Exam 2043 eligibility list has had a statistically significant disparate impact upon Hispanics in terms of appointments, disproportionately eliminating them from any possibility of appointment to date. The disparity between the rates at which Hispanic candidates and white candidates on the eligibility list have been reached for possible appointment is statistically significant, equivalent to 5.04 units of standard deviation.

- One practical effect on African-American candidates of the disparate impact of the City's rank-order processing/selection from the Exam 2043 eligibility list is that 95 African Americans have been eliminated from any possibility of appointment to date, and an estimated 42 fewer African Americans have been appointed as firefighters. The ratio of the rates at which African-American and white candidates on the eligibility list have been reached for possible appointment is 67.6%.

- One practical effect on Hispanic candidates of the disparate impact of the City's rank-order processing/selection from the Exam 2043 eligibility list is that 63 Hispanics have been eliminated from any possibility of appointment to date, and an estimated 28 fewer Hispanics have been appointed as firefighters. The ratio of the rates at which Hispanic and white candidates on the eligibility list have been reached for possible appointment is 86.9%.

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- The disparate impact of the City's rank-order processing/selection from the Exam 2043 eligibility list also has had a practical effect upon African-American firefighters who were appointed from Exam 2043. African-American candidates have been reached on the eligibility list later than white candidates and, as a result, 44 African-American firefighters who have been appointed from Exam 2043 would have been appointed earlier, but for the disparate impact. These 44 African-American firefighters have lost a total of approximately 14 years and 1 month of employment. On average, each of the 44 has lost approximately 4 months of seniority and wages.

- The disparate impact of the City's rank-order processing/selection from the Exam 2043 eligibility list also has had a practical effect upon Hispanic firefighters who were appointed from Exam 2043. Hispanic candidates have been reached on the eligibility list later than white candidates and, as a result, 51 Hispanic firefighters who have been appointed from Exam 2043 would have been appointed earlier, but for the disparate impact. These 51 Hispanic firefighters have lost a total of approximately 12 years and 4 months of employment. On average, each of the 51 has lost approximately 3 months of seniority and wages.

- In summary, the City's pass/fail use of Written Exam 7029 has resulted in a disparate impact upon both African-American and Hispanic candidates. As a result of this disparate impact, 801 fewer African-American and Hispanic candidates passed Written Exam 7029, and I estimate that the City appointed 176 fewer African-American and Hispanic firefighters than it would have absent the disparate impact. In addition, the City's rank-order processing/selection from the Exam 7029 eligibility

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list has resulted in a disparate impact upon both African-American and Hispanic candidates, resulting in delayed appointments for 154 of the African-American and Hispanic firefighters who were appointed from Exam 7029, for a total loss of over 43 years of wages and seniority by these African-American and Hispanic firefighters.

● In summary, the City's pass/fail use of Written Exam 2043 also has resulted in a disparate impact upon both African-American and Hispanic candidates. As a result of this disparate impact, 259 fewer African-American and Hispanic candidates passed Written Exam 2043, and I estimate that, to date, the City has appointed 47 fewer African-American and Hispanic firefighters than it would have absent the disparate impact of its pass/fail use of Written Exam 2043. In addition, the City's rank-order processing/selection from the Exam 2043 eligibility list has resulted in a disparate impact upon both African-American and Hispanic candidates. As a result of this disparate impact, to date: (i) 158 fewer African-American and Hispanic candidates have been reached on the eligibility list for possible appointment, and I estimate that the City has appointed 70 fewer African-American and Hispanic firefighters than it would have absent the disparate impact of its rank-order process; and (ii) the appointments of 95 of the African-American and Hispanic firefighters who have been appointed from Exam 2043 have been delayed, for a total loss of over 26 years of wages and seniority by African-American and Hispanic firefighters.

III.   DATA

My analyses in this report rely upon two databases for each Exam (7029 and 2043) supplied by the City. One database, the applicant data file, contains the name, race/national origin, Social

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Security number and other identifying information for each candidate and, for each candidate:

(i)   written examination raw score;

(ii)   written examination standardized score;

(iii)   PPT raw score;

(iv)   PPT standardized score;

(v)   combined (written and PPT) score;

(vi)   eligibility for Veterans or Disabled Veterans Credit;

(vii)   Legacy Credit, if any;

(viii)   Residency Credit, if any;

(ix)   Adjusted Final Average;

(x)   list number (rank) on the eligibility list;

(xi)   first certification date and Disposition Action Code; and

(xii)   last certification date and Disposition Action Code.

The other database for each Exam, the CID data file, contains the appointment date for each candidate appointed from the Exam. This data was provided to me in computer readable form. It is my understanding that the applicant data was supplied to the United States by the City on two CDs, one labeled "Exam 7029 Corrected Applicant Data" and the other labeled "2043 Corrected;" and the CID data was supplied to the United States by the City on a CD labeled "CID 2043 + 7029 8/22/07." I also was supplied with certain information listed in Appendix B, some of which helped to explain the data.

For some candidates, the data was not consistent. Because of the small number of candidates with inconsistent data, none of the data inconsistencies, singly or in combination, affect my

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conclusions regarding the disparate impact of the practices challenged by the United States.   See Appendix C for a description of the data inconsistencies and my handling of them for purposes of my analyses.

IV.   BACKGROUND AND METHODOLOGY

A.   Overview of Examination Process

Since February 2001, the City has appointed entry-level firefighters from two open competitive examination processes, Exam 7029 and Exam 2043.   Exams 7029 and 2043 each involved the administration of a written examination as well as a PPT. The written examination used as part of Exam 7029 was administered in February 1999.[2] The City used the Exam 7029 eligibility list to appoint firefighters from February 2001 until December 2004. The written examination used as part of Exam 2043 was administered in December 2002.[3] The City has used the Exam 2043 eligibility list since May 2004 (i.e., there was some overlap in the City's use of the Exam 7029 and 2043 eligibility lists) and has stated that it will continue to use the Exam 2043 eligibility list until May 2008, when the list will expire.

The City used both Written Exam 7029 and Written Exam 2043 on a "pass/fail basis." The

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[2]   It is my understanding that the main administration of Written Exam 7029 took place on February 27, 1999, and most candidates took the written examination on that date, but the City also administered Written Exam 7029 on other dates. The earliest written examination date in the applicant data produced by the City for Exam 7029 is February 26, 1999. The latest written examination date in the applicant data produced by the City for Exam 7029 is December 14, 2002.

[3]   It is my understanding that the first administration of Written Exam 2043 took place on December 14, 2002, and most candidates took the written examination on that date, but the City continues to administer Written Exam 2043. The latest written examination date in the Exam 2043 applicant data produced by the City last September is March 23, 2007.

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City used a cutoff score of 84.705 on Written Exam 7029 and a cutoff score of 70 on Written Exam 2043. In other words, only those candidates who scored at least 84.705 on Written Exam 7029 were eligible to continue on in the selection process and take the PPT. Similarly, only those candidates who scored higher than 70 on Written Exam 2043 were eligible to continue on in the selection process and take the PPT.[4] The City used the same PPT, PPT scoring method and PPT passing standard for both Exam 7029 and Exam 2043.

The City also used both Written Exam 7029 and Written Exam 2043 as part of its "rank-order" processing and selection of candidates from among those who passed the written examination and the PPT. Candidates who passed both the written examination and the PPT were placed on an eligibility list in descending order of their Adjusted Final Average score, which is a combination of written examination and PPT scores ("combined score"), plus bonus points. In other words, candidates were assigned a list number (or rank) on the eligibility list based on their Adjusted Final Average, with the lowest list number being assigned to the candidate with the highest Adjusted Final Average (*i.e.*, the candidate with the highest Adjusted Final Average was given list number 1). The City calculated each candidate's Adjusted Final Average using a system that weighted and combined the candidate's written examination and PPT scores, then transformed (*i.e.*, scaled) the combined score so that the lowest combined score was 70 and the highest combined score was 100. Any bonus points from Veterans Credits, Legacy Credits or Residency Credits were added to create the Adjusted

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[4]   Because a candidate's score on the written examination is the percentage of the 85 examination questions that the candidate answered correctly, the lowest possible passing score on Written Exam 2043 actually was 70.588.

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Final Average.[5] The City handled ties (*i.e.*, candidates who have exactly the same Adjusted Final Average) by assigning the tied candidates list numbers based on a nine digit number consisting of the last five digits of each candidate's Social Security number followed by the first four digits of the candidate's Social Security number. The City begins processing candidates from the eligibility lists in order of their list numbers. The City appoints candidates who have been determined to meet all qualifications for appointment in ascending order of their list numbers (*i.e.*, beginning with list number 1).[6]

B.   Methodology for Determining Disparate Impact of the City's Pass/Fail Use of the Written Examinations

An employer's use of an examination on a pass/fail basis is said to have a disparate impact upon a protected class if members of the protected class have a statistically significantly lower likelihood than other test takers of passing the test. In measuring whether the City's pass/fail use of Written Exam 7029 and Written Exam 2043 had a disparate impact upon African Americans and Hispanics, I have focused on the difference between the rates at which African-American and white candidates, as well as Hispanic and white candidates, passed Written Exams 7029 and 2043. I use

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[5]   See Appendix D and Appendix E for the City's description of the mechanics of this process for Exam 7029 and Exam 2043, respectively.

[6]   It is my understanding that factors other than the candidate's list number may have affected the candidate's appointment date. For example, I understand that a candidate may have been considered "not qualified" on a given certification list if the City had not been able to reach the candidate to begin evaluating the candidate's other qualifications or if the candidate had not yet provided documentation of his/her qualifications. In addition, a candidate with a higher list number may have been certified before a candidate with a lower list number. For example, the candidate with the lower list number may have withdrawn temporarily from consideration for personal reasons. *See* Rule 30(b)(6) Deposition of the City (D. Tow, designee), pp. 94-95 and 106-108. In either case, the candidate with the lower list number could later be certified, found qualified and appointed.

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the passing rate for white candidates as the benchmark because the *Uniform Guidelines on Employee Selection Procedures* suggest that the success rate of the class of interest (African Americans or Hispanics) should be compared to that of the best performing or majority group (whites). If there is a statistically significant difference between the pass rates of African-American and white candidates, or Hispanic and white candidates, one can conclude that this disparity is associated with race or national origin, respectively, rather than chance. In other words, if African-American or Hispanic candidates pass the written examination at a statistically significantly lower rate than whites, then the adverse impact on African Americans and Hispanics is not the result of chance but, instead, is attributable to the fact that African-American and Hispanic candidates really have a lower likelihood of passing the written examination than do white candidates.

Statisticians, testing experts, and other social scientists normally consider a disparity to be statistically significant if there is a 5% or lower likelihood (*i.e.*, probability) that so large a disparity would occur by chance. A disparity can also be described in terms of units of standard deviation. Units of standard deviation correspond to the likelihood that an observed disparity at least as large as the one obtained would occur by chance. For example, the 5% standard equates to slightly less than two (1.965) units of standard deviation. A disparity of three units of standard deviation equates to a 0.3% (*i.e.*, 3-in-1,000) likelihood of at least as large a disparity occurring by chance.

In some instances, a statistically significant disparity may not have a real-world effect large enough to be considered of practical significance. That is ultimately a judgment that must be made by the trier of fact; it cannot be determined by a statistical test. However, descriptive statistics can assist the decision maker by providing information that quantifies the practical effect of the disparity. One such statistic is the shortfall in African-American or Hispanic candidates who pass the

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examination. The shortfall is the number of additional African Americans or Hispanics we would expect to pass the examination at issue if the pass rate of African Americans or Hispanics were equal to that of whites (*i.e.*, the shortfall measure finds the "shortfall" in African-American or Hispanic examination passers). Thus, the shortfall gives the Court information about the practical effect of the disparity in terms of how many African Americans and Hispanics failed because of the disparate impact of the examination. This is especially useful when there is a large number of applicants because, in such a situation, a relatively small disparity has an effect on a larger number of individuals.

One can precisely determine the shortfall in examination passers by race and national origin. Because the City did not allow candidates who failed the written examination to proceed in the selection process, one cannot determine <u>which</u> of the additional individuals who failed the written examination because of its disparate impact would have been appointed absent the disparate impact. However, as a further measure of real-world effect, one can estimate the number of additional African Americans and Hispanics who would have been appointed.[7] To do this in this case, one must consider (i) the likelihood that a candidate who failed the written examination would have passed the PPT had the candidate been allowed to take it, and (ii) the likelihood that a candidate who failed the written examination would have met all of the other requirements for appointment. In order to consider (i), I assumed that African Americans or Hispanics who failed the written examination

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[7]   This "bottom line" measure should not be confused with evidence that the employment practice at issue had a statistically significant disparate impact. *See Connecticut v. Teal*, 457 U.S. 440, 452 (1982)(disparate impact is established where a pass/fail component of the selection process prevents a disproportionately large number of minorities from proceeding to the next step of the process even if the overall process results in promotion or hire of minority applicants at the same rate as non-minority applicants).

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would have taken and passed the PPT at the same rate as written examination passers of the same gender. I took gender into consideration because male candidates had a significantly higher likelihood of passing the PPT than female candidates. To consider (ii), I assumed that the additional African Americans and Hispanics who would have passed the PPT would have met all other requirements and been appointed at the overall selection rate of candidates who actually were on the eligibility list.[8]

The "80 Percent Rule" also has sometimes been considered as a measure of practical significance. To use the 80 Percent Rule, one computes the ratio of the pass rate of one group *(e.g.,* African Americans or Hispanics) to that of another group *(e.g.,* whites) and compares the ratio to 80%. The 80 Percent Rule is not a good measure of practical significance. It is arbitrary and used simply as a rule of thumb. The 80 Percent Rule, although easy to calculate and to apply, fails to capture most of the relevant factors one should consider in evaluating the practical implications of a statistically significant *(i.e.,* real) disparate impact. The shortfall measure is more useful because it specifies the number of protected class members who would have been expected to pass the examination at issue absent the disparate impact. The shortfall method also can be used to estimate the additional number of protected class members who ultimately would have been selected (for example, the shortfall in hires). Thus, the decision maker has information about the actual magnitude of the impact on the protected class. Nevertheless, I have calculated the ratios of the pass rates of African Americans and whites, and Hispanics and whites, and present the results in my report for reference.

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[8]   In computing the overall selection rate, my data is restricted to whites, Hispanics and African Americans.

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C.   "Effective" Passing Score Methodology for Determining Impact of the City's Use of the Written Examinations

In a case like this, in which placement of candidates on an eligibility list is a function (in whole or in part) of a written examination score, and the eligibility list is not exhausted,[9] it is possible that a candidate who nominally passed the written examination scored so low on it that the candidate could not have been appointed, regardless of the candidate's performance on the other steps in the selection process.   Such candidates have "effectively failed" the written examination, although they nominally passed it.   Therefore, I defined and studied not only differences in pass rates, but also differences in "effective pass rates" (i.e., rates at which candidates scored high enough on the written examination to have any possibility of being appointed).[10]   Obviously, if the eligibility list is

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[9]   An eligibility list is exhausted when all of the candidates on the list are either appointed, disqualified or otherwise unavailable for appointment (e.g., on the Exam 7029 and 2043 eligibility lists, some candidates were deceased when reached on the list).   The City has indicated that the Exam 7029 eligibility list was exhausted.   The applicant database for Exam 7029 produced by the City does not indicate the reasons some candidates were not appointed (i.e., for some candidates who were not appointed, the Disposition Action Codes do not indicate that the candidate was disqualified or unavailable).   Nonetheless, the applicant database and CID data provided by the City indicate that the lowest-ranked candidate appointed was seventh from last on the eligibility list and that the six lower-ranking candidates were found not qualified or failed to report for or cooperate in the FDNY's processing.   Thus, the data produced by the City appears to confirm that the Exam 7029 eligibility list was exhausted.   It is my understanding that additional data, not produced by the City in answer to the United States' discovery requests, contains information that may disclose reasons some candidates were not hired.   To the extent that such data is produced and affects any of my analyses or conclusions, I may amend or supplement this report.

[10]   In some circumstances, it is important to focus upon the effective passing score. Otherwise, an employer could obscure the impact of an examination by simply setting the nominal pass/fail cutoff low enough to eliminate disparate impact, while using a rank-order hiring practice such that many nominal passers could never be selected due to their examination score.   This is most obvious when the employer ranks applicants based wholly on the basis of their scores on the examination of interest.   However, as shown in this report, it also may be the case when the employer ranks applicants in part on the basis of their scores on the examination.

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exhausted, as it was for Exam 7029, the effective passing rate and the nominal passing rate will be the same.

D.   Methodology for Determining Impact of Rank-Order Processing/Selection

1.   Disparate Impact of Ranking

As explained above, the City has appointed candidates from the Exam 7029 and 2043 eligibility lists in rank-order based on their Adjusted Final Averages, which result from a combination of each candidate's written examination and PPT scores, plus bonus points. To test whether African Americans or Hispanics are ranked lower than whites on the eligibility list, one can conduct a statistical test (*i.e.*, the Mann-Whitney Rank Sum Test) to determine if the ranks of African Americans or Hispanics are statistically significantly lower than those of whites.

2.   Effect of Eliminating Candidates from Possible Appointment

The most obvious effect of rank-order selection occurs when a candidate is ranked so low on the list that the candidate's list number is not reached for possible appointment before the list expires. In that case, the candidate is eliminated from any possibility of appointment because of the candidate's rank (list number) on the eligibility list. In essence, the candidate "fails" the "ranking test." Thus, one can measure the disparate impact of the City's use of rank-order processing/selection with the same pass/fail analysis described above for measuring the disparate impact of the City's pass/fail use of the written examinations. That is, one can determine whether African-American or Hispanic candidates on the eligibility list were significantly less likely than white applicants to pass the ranking test by being ranked high enough to have any possibility of appointment.

3.   Effect of Delaying Appointment

Even if a candidate is not eliminated from consideration due to the candidate's rank, the

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candidate's opportunity for appointment may be delayed because appointments are made in rank order

from among candidates determined to be qualified. If African-American or Hispanic candidates are,

on average, ranked lower than white candidates, on average, the ranking process may delay their

opportunity for appointment.[11] That is, as a result of their lower rankings, African Americans and

Hispanics who are appointed will be appointed later than they would have been had they ranked like

white candidates, and they will lose both income and seniority. To measure the effect of the disparity

in ranks in terms of delay, one can (i) compute the distribution by appointment date of African-

American (or Hispanic) appointments that would be expected if African Americans (or Hispanics)

had been distributed throughout the eligibility list the same as the overall distribution,[12] and

(ii) compare the expected figures to the actual figures by appointment date. If the expected figures

are higher than the actual figures for a given appointment date, this indicates a shortfall in African-

American or Hispanic appointments on that date due to the disparity in ranking. That is, if the

ranking did not have a disparate impact, African Americans and Hispanics who are disproportionately

lower on the list would have been higher on the list and appointed to an earlier class. One then can

quantify the effect of the delay by (i) making the distribution of appointment dates for African

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[11]   It also may affect their likelihood of actually being appointed. The data shows
that, apart from race or national origin, the lower a candidate's rank, the more likely the
candidate will not be appointed, even if the candidate is reached in the rank-order process for
possible appointment. However, I do not consider this effect in my analysis of delay. It is my
understanding that additional data, not produced by the City in answer to the United States'
discovery requests, contains information that may disclose reasons some candidates were not
hired. To the extent that such data is produced and affects any of my analyses or conclusions, I
may amend or supplement this report.

[12]   I assume that white appointment dates cannot be changed, and I reassign African
American and Hispanic appointment dates based on the overall appointment distribution, not the
white distribution.

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Americans and Hispanics the same as the overall distribution (by moving African Americans and Hispanics up on the list), and (ii) calculating the lost period of employment (and, hence, wages and seniority) of African Americans and Hispanics that resulted from the disparate impact of the ranking process.[13]

V.   ANALYSIS AND FINDINGS

A.   Pass/Fail Use of Written Exam 7029

1.   The City's Pass/Fail Use of Written Exam 7029 with a Cutoff Score of 84.705 Resulted in a Disparate Impact upon African-American Candidates

As stated previously, the City used a passing score of 84.705 for Written Exam 7029. Only candidates who passed Written Exam 7029 were allowed to continue on in the selection process and take the PPT. Table 1 summarizes the disparate impact of the City's pass/fail use of Written Exam 7029 upon African Americans.

Table 1 shows that the City's pass/fail use of Written Exam 7029 had a highly statistically significant disparate impact upon African-American candidates. The disparity is equivalent to 33.9 units of standard deviation. The likelihood of such a disparity occurring by chance is infinitesimally small, less than 1-in-4.5 million billion.

I understand that the City has suggested that this highly statistically significant finding is due to the large sample size involved in the analysis of FDNY firefighter candidate data. The City is correct that a given disparity in pass rates may be statistically significant with a large sample and not with a smaller sample. In other words, the larger the sample size, the smaller the actual disparity need

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[13]   These computations use the actual appointment dates. Any deviations in appointment dates from perfect rank order (see footnote 6 for why this might occur) are assumed to be independent of race and national origin. If the analysis were to assume that all appointments were made in perfect rank order, there would be little difference in the results.

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be to reach statistical significance. Thus, a finding of statistical significance does in part reflect the large sample size. However, the finding of statistical significance does not depend only on sample size; it also is a factor of the size of the disparity. Here, if the Exam 7029 sample size were reduced by 90% (so that there were only 1,292 white candidates and 175 African-American candidates) and the same disparity between the pass rates of African-American candidates and white candidates were to occur, the results still would be highly statistically significant. With the reduced sample size, the disparity would be equivalent to 10.53 units of standard deviation. The likelihood of such a disparity occurring by chance is infinitesimally small, less than 1-in-4.5 million billion. Thus, the City's suggestion that a significant disparity would not have been found if the sample had not been so large is not supported by the data.

In terms of practical effect, Table 1 shows that the disparate impact of the City's pass/fail use of Written Exam 7029 resulted in a shortfall of 519 African-American written examination passers. That is, if African-American candidates had passed Written Exam 7029 at the same rate as white candidates, an additional 519 African Americans, or nearly three-quarters (74.5%) of the African Americans who failed the written examination, would have passed it. Using the methodology described in Section IV. B. of my report, an estimated 114 of them would have been appointed.[14] Thus, if the test had not resulted in a disparate impact upon African Americans, the number of African-American appointees would have increased by over 100%, from 104 to 218. The ratio of the African-American pass rate to the white pass rate is 67.0%.

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[14]   Since the eligibility list was exhausted, the only reason a candidate on the eligibility list would not have been appointed is because the candidate was disqualified or unavailable, not because of a lack of available positions. The estimation methodology accounts for candidates on the list being disqualified or unavailable.

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2.   The City's Pass/Fail Use of Written Exam 7029 with a Cutoff Score of 84.705
         Resulted in a Disparate Impact upon Hispanic Candidates

Table 2 summarizes the disparate impact of the City's pass/fail use of Written Exam 7029 on

Hispanics. Table 2 shows that the City's use of Written Exam 7029 with a cutoff score of 84.705 had

a highly statistically significant disparate impact upon Hispanic candidates. The disparity between

the Hispanic and white pass rates is equivalent to 17.41 units of standard deviation. The likelihood

of such a disparity occurring by chance is infinitesimally small, less than 1-in-4.5 million billion.

Again, I understand that the City suggests that this highly statistically significant finding is

due to the large sample size. As noted above, although the City is correct that the larger the sample

size, the smaller the actual disparity must be to reach statistical significance, the City fails to consider

that my finding of statistical significance also depends on the size of the disparity. If the sample size

were 90% smaller (so that there were only 1,292 white candidates and 213 Hispanic candidates) and

the same disparity were to occur, the results still would be highly statistically significant. With the

reduced sample size, the disparity would be equivalent to 5.48 units of standard deviation (an event

which would occur by chance less than 1-in-24 million times). Thus, the finding of statistical

significance cannot reasonably be attributed to the large sample size.

In terms of practical effect, Table 2 shows that, as a result of the City's pass/fail use of Written

Exam 7029, there was a shortfall of 282 Hispanic written examination passers. In other words, more

than one-half (56.9%) of the 496 Hispanic candidates who failed Written Exam 7029 would have

passed it if there had not been a disparate impact upon Hispanics. Using the methodology described

in Section IV. B. of my report, an estimated 62 of them would have been appointed. Thus, if the test

had not resulted in a disparate impact upon Hispanics, the number of Hispanic appointees would have

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increased by about 23%, from 273 to 335. The ratio of the Hispanic pass rate to the white pass rate is 85.3%.

      B.   Rank-Order Processing/Selection of Candidates from the Exam 7029 Eligibility List Based upon Combined Written Examination and PPT Scores

            1.   The City's Rank-Order Processing/Selection of Candidates from the Exam 7029 Eligibility List Resulted in a Disparate Impact upon African Americans

As explained previously, candidates who passed both Written Exam 7029 and the PPT were placed on the Exam 7029 eligibility list. The City appointed qualified candidates from the eligibility list in rank order. A candidate's rank/list number depended on (i) the candidate's scores on the written examination and PPT, (ii) the City's methodology for combining the two scores, (iii) the candidate's bonus points, and (iv) the City's methodology for breaking ties. The use of bonus points works to the advantage of African Americans and Hispanics and reduces the disparate impact of the rank-order process. Ties are broken in an essentially random process and should have no effect on the disparate impact of the rank-order process. Because the eligibility list for Exam 7029 was exhausted, I analyzed only the effect of the rank-order process in terms of delaying the appointment of African Americans and Hispanics.[15]

To determine whether the rank-order process resulted in a disparate impact on African Americans in terms of delay, I conducted a statistical test (*i.e.*, the Mann-Whitney Rank Sum Test) and found that African Americans were ranked statistically significantly lower than whites. The disparity in ranks is equivalent to 6.48 units of standard deviation. The likelihood that this large a disparity would occur by chance is less than 1-in-11 billion.

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[15]   As noted earlier, however, being ranked lower on the eligibility list also affects a candidate's likelihood of being appointed, even if the candidate is reached on the eligibility list. I do not consider this effect.

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In practical terms, the effect of the disparity in ranks was, on average, to delay the appointment of African Americans from the Exam 7029 eligibility list. Table 3 Part A presents the shortfall and surplus in African-American appointments by date of appointment, assuming that the appointment date distribution was statistically independent of race. Table 3 Part B shows the change in African-American appointment dates that would have had to occur to eliminate the disparate impact of the rank-order process. For example, Table 3 Part A shows that the expected number of African Americans appointed to the first academy class is 5, absent the disparity in ranks. Therefore, Table 3 Part B shows that the first 5 African Americans appointed all should have been appointed to the first class (*i.e.*, the February 4, 2001 class). Table 3 Part B also summarizes the total period of wages and seniority lost by the African-American firefighters whose appointment from the Exam 7029 eligibility list was delayed and the average loss for each African-American firefighter whose appointment was delayed. The 68 African-American firefighters whose appointments from Exam 7029 were delayed lost a total of approximately 20 years of wages and seniority as a result of the disparate impact of the rank-order process. The average loss for an individual African-American firefighter whose appointment was delayed was about 3 1/2 months of wages and seniority.

2.   The City's Rank-Order Processing/Selection of Candidates from the Exam 7029 Eligibility List Resulted in a Disparate Impact upon Hispanics

To determine whether the rank-order process resulted in a disparate impact upon Hispanics, I conducted the same statistical test I conducted with regard to African Americans (*i.e.*, the Mann-Whitney Rank Sum Test) and found that Hispanics also were ranked statistically significantly lower than whites. The disparity in ranks is equivalent to 4.57 units of standard deviation. The likelihood that this large a disparity would occur by chance is less than 1-in-204,000.

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In practical terms, the effect of the disparity in ranks was, on average, to delay the appointment of Hispanics from the Exam 7029 eligibility list. Table 4 Part A presents the shortfall and surplus in Hispanic appointments by date of appointment, assuming that the appointment date distribution was statistically independent of national origin. Table 4 Part B shows the change in Hispanic appointment dates that would have had to occur to eliminate the disparate impact of the rank-order process. Table 4 Part B also summarizes the total period of wages and seniority lost by Hispanic firefighters appointed from Exam 7029 and the average loss for each Hispanic firefighter whose appointment was delayed. The 86 Hispanic firefighters whose appointments from Exam 7029 were delayed due to the disparate impact of the rank-order process lost a total of approximately 23 years and 1 month of wages and seniority as a result of the disparate impact of the rank-order process. The average loss for an individual Hispanic firefighter whose appointment was delayed was slightly more than 3 months of wages and seniority.

C.   Pass/Fail Use of Written Exam 2043

      1.   The City's Pass/Fail Use of Written Exam 2043 with a Cutoff Score of 70 Has Resulted in a Disparate Impact upon African-American Candidates

Table 5 shows that the City's pass/fail use of Written Exam 2043 has resulted in a statistically significant disparate impact upon African-American candidates. The disparity between the African-American pass rate and the white pass rate is equivalent to 21.84 units of standard deviation. The likelihood of such a disparity occurring by chance is infinitesimally small, less than 1-in-4.5 million billion.

To address the City's suggestion that this statistically significant finding is due to the large sample size, I again evaluated the results using a sample size reduced by 90% (so that there were

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1,388 white candidates and 139 African-American candidates). If the same size disparity were to

occur in the reduced sample, the disparity still would be statistically significant at 6.60 units of

standard deviation. The likelihood of such a disparity occurring by chance is less than 1-in-2.4

billion. Again, the data does not support the City's suggestion.

In terms of practical effect, Table 5 shows that the City's pass/fail use of Written Exam 2043

with a cutoff score of 70 has resulted in a shortfall of 165 African-American written examination

passers. That is, if African-American candidates had passed Written Exam 2043 at the same rate as

white candidates, well over three-quarters (81.3%) of the African Americans who failed Written

Exam 2043 would have passed it. Using the methodology described in Section IV. B. of my report,

to date, an estimated 30 additional African Americans would have been appointed as firefighters.[16]

The ratio of the African-American and white pass rates is 87.8%.

> 2.   The City's Pass/Fail Use of Written Exam 2043 with a Cutoff Score of 70 Has
> Resulted in a Disparate Impact upon Hispanic Candidates

Table 6 shows that the City's pass/fail use of Written Exam 2043 has resulted in a statistically

significant disparate impact upon Hispanic candidates. The disparity between the Hispanic pass rate

and the white pass rate is equivalent to 10.46 units of standard deviation. The likelihood of such a

disparity occurring by chance is infinitesimally small, less than 1-in-4.5 million billion.

Again, to address the City's suggestion that this highly statistically significant finding is due

to the large sample size, I evaluated the results using a sample size reduced by 90% (so that there were

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[16]   Because the City continues to appoint firefighters from the Exam 2043 eligibility
list, the number of appointments I estimate would have been made from the 165 additional
African Americans who would have passed Written Exam 2043 had it not had a disparate impact
will slightly increase as the City makes additional appointments, since the overall hire rate will
increase.

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1,388 white candidates and 212 Hispanic candidates). If the same size disparity were to occur in the reduced sample, the disparity still would be statistically significant at 3.08 units of standard deviation. The likelihood of such a disparity occurring by chance is less than 3-in-1,000. Again, the data does not support the City's suggestion.

In terms of practical effect, Table 6 shows that, as a result of the City's pass/fail use of Written Exam 2043 with a cutoff score of 70, there was a shortfall of 94 Hispanic written examination passers. In other words, if Hispanic candidates had passed Written Exam 2043 at the same rate as white candidates, well over half (61.8%) of the Hispanics who failed Written Exam 2043 would have passed it. Using the methodology described in Section IV. B. of my report, to date, an estimated 17 additional Hispanic written examination passers would have been appointed as firefighters.[17] The ratio of the Hispanic pass rate to the white pass rate is 95.5%.

D.   Both African-American and Hispanic Candidates Disproportionately "Failed" Written Exam 2043 at the Effective Cutoff Score

1.   African-American Candidates Disproportionately "Failed" Written Exam 2043 at the Effective Cutoff Score

As stated previously, the City has not exhausted the Exam 2043 eligibility list. The eligibility list contains 7,485 candidates, and to date the City has not appointed any of the candidates with list numbers higher than 4825.5. Unlike the case of Exam 7029, where the City exhausted the eligibility list, candidates who nominally passed Written Exam 2043 by scoring above 70 may have scored too low to have had any chance of being appointed to date, regardless of what they did or would have

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[17]   Because the City continues to appoint firefighters from the Exam 2043 eligibility list, the number of appointments I estimate would have been made from the 94 additional Hispanics who would have passed Written Exam 2043 had it not had a disparate impact will slightly increase as the City makes more appointments, since the overall hire rate will be increasing.

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done on any subsequent tests (*i.e.*, even if they scored 100 on the PPT and passed all other requirements, they would not have been appointed to date). In other words, candidates who nominally passed Written Exam 2043 may have effectively failed it.

To evaluate the full impact of the City's use of Written Exam 2043, I replicated Table 5 using the effective cutoff score on Written Exam 2043 (rather than the nominal cutoff score of 70). To do so, I calculated the minimum score on Written Exam 2043 that a candidate would have needed, given the number of bonus points the candidate was awarded, to have had any chance of being reached for appointment to date.[18] Table 7 presents the results.[19]

Table 7 shows that the disparity between the effective pass rate of African Americans and the effective pass rate of whites on Written Exam 2043 is highly statistically significant. The disparity between the African-American and white effective pass rates is equivalent to 21.89 units of standard deviation. The likelihood of such a disparity occurring by chance is infinitesimally small, less than 1-in-4.5 million billion.[20] Even if the sample size were reduced by 90%, a disparity of the same size

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[18]   That is, I calculated the lowest written examination score the candidate could have gotten that would have given the candidate a Final Adjusted Average high enough to be reached for possible appointment if the candidate had scored 100 on the PPT.

[19]   It is my understanding that the City will continue to use the Exam 2043 eligibility list until May 2008. If appointments from the eligibility list continue at the same rate as in the past, the last candidate appointed would be ranked 689 candidates below the last candidate appointed to date. Therefore, I also have calculated the effective pass rates based on the City continuing to appoint candidates 400, 800 and 1,000 candidates further down the Exam 2043 eligibility list. The results are shown in Table 8.

[20]   If, before May 2008, when the Exam 2043 eligibility list expires, the City were to appoint candidates down to 1,000 candidates below the last candidate currently appointed, the disparity between the African-American and white effective pass rates would remain highly statistically significant. As shown in Table 8, the disparity would be equivalent to 22.44 units of standard deviation. The likelihood of such a disparity occurring by chance is infinitesimally small, less than 1-in-4.5 million billion.

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between the African-American and white effective pass rates still would be highly statistically

significant, equivalent to 6.78 units of standard deviation. The likelihood that such a disparity would

occur by chance is less than 1-in-83 million.

In terms of practical effect, Table 7 shows that, as a result of the disparity between the

African-American and white effective pass rates on Written Exam 2043, 401 African Americans have

been effectively eliminated from any possibility of appointment to date. Absent the disparity, to date,

an estimated 70 additional African Americans would have been appointed as FDNY firefighters. The

ratio of the African-American effective pass rate to the white effective pass rate is 59.0%.[21]

2.   Hispanic Candidates Disproportionately "Failed" Written Exam 2043 at the Effective
      Cutoff Score

Table 9 presents the results for Hispanics corresponding to those presented in Table 7 for

African Americans.[22] Table 9 shows that the disparity between the effective pass rate of Hispanics

and the effective pass rate of whites on Written Exam 2043 is highly statistically significant. The

disparity between the Hispanic and white effective pass rates is equivalent to 10.52 units of standard

deviation. The likelihood of such a disparity occurring by chance is infinitesimally small, less than

1-in-4.5 million billion.[23] Even if the sample size were reduced by 90%, a disparity of the same size

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[21]   Table 8 shows the comparable shortfall in African-American effective passers and
the ratio of the African-American effective pass rate to the white effective pass rate if the City
were to reach 400, 800 and 1,000 candidates further down the Exam 2043 eligibility list before
the list expires in May 2008.

[22]   Table 10 presents the results for Hispanics corresponding to those presented in
Table 8 for African Americans (i.e., results based on the City continuing to appoint candidates
400, 800 and 1,000 candidates further down the Exam 2043 eligibility list).

[23]   If, before May 2008, when the Exam 2043 eligibility list expires, the City were to
appoint candidates down to 1,000 candidates below the last candidate currently appointed, the
disparity between the Hispanic and white effective pass rates would remain highly statistically

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between the Hispanic and white effective pass rates still would be statistically significant, equivalent

to 3.24 units of standard deviation. The likelihood that such a disparity would occur by chance is less

than 1-in-837.

In terms of practical effect, Table 9 shows that, as a result of the disparity between the

Hispanic and white effective pass rates on Written Exam 2043, 242 Hispanics have been effectively

eliminated from any possibility of appointment to date. Absent the disparity, to date, an estimated

45 additional Hispanics would have been appointed as FDNY firefighters. The ratio of the Hispanic

effective pass rate to the white effective pass rate is 83.8%.[24]

> E.   Rank-Order Processing/Selection of Candidates Based on a Combination of Written Exam 2043 and PPT Scores

>> 1.   The City's Use of Rank-Order Processing/Selection of Candidates Based on a Combination of Written Exam 2043 and PPT Scores Has Resulted in a Disparate Impact upon African-American Candidates

>>> a.   The City's Method of Ranking Candidates Based on a Combination of Written Exam 2043 and PPT Scores Has Resulted in Disproportionately Low Ranks for African-American Candidates

As explained previously, candidates who passed both Written Exam 2043 and the PPT were

placed on the Exam 2043 eligibility list. The City appointed qualified candidates from the eligibility

list in rank order (*i.e.*, in order by list number). A candidate's rank/list number depends on (i) the

candidate's scores on the written examination and PPT; (ii) the City's methodology for combining

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significant. As shown in Table 10, the disparity would be equivalent to 10.71 units of standard
deviation. The likelihood that such a disparity would occur by chance is infinitesimally small,
less than 1-in-4.5 million billion.

[24]   Table 11 shows the comparable shortfall in Hispanic effective passers and the
ratio of the Hispanic effective pass rate to the white effective pass rate if the City were to reach
400, 800 and 1,000 candidates further down the Exam 2043 before the list expires in May 2008.

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the two scores; (iii) the candidate's bonus points; and (iv) the City's methodology for breaking ties. The use of bonus points works to the advantage of African Americans and Hispanics and reduces the disparate impact of the rank-order process. The City's handling of ties should have no effect on the disparate impact of the rank-order process because the tie-breaker (based on Social Security number) is essentially random.

The Mann-Whitney Rank Sum Test shows that African Americans are ranked statistically significantly lower than whites on the Exam 2043 eligibility list. The disparity between African-American and white ranks is equivalent to 9.45 units of standard deviation. The likelihood of such a disparity occurring by chance is infinitesimally small, less than 1-in-4.5 million billion.

     b.   Effect of Eliminating African-American Candidates from Possible Appointment

As stated previously, currently, the list number of the lowest-ranked candidate appointed from the Exam 2043 eligibility list is 4,825.5. In other words, to date, candidates with list numbers above 4,825.5 have had no possibility of being appointed. As explained in Section IV.D. of my report, such persons have "failed" the "ranking test," and we can measure the disparate impact of the City's rank-order process the same way we measure the impact of any pass/fail test.[25]

Table 11 shows that the disparity in ranking "pass rates" between African Americans and whites is highly statistically significant (*i.e.*, the disparity between the percentages of African-

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[25]   Of course, this impact is not independent of the impact of the written examination, as measured by the effective cutoff score in the previous section of this report. The analysis summarized in this section of my report takes into consideration the effect of the City's method of assigning list numbers/ranks to candidates on the eligibility list. Thus, the current analysis takes into account candidates' performance on the written examination and PPT, the method the City has used to combine the written examination and PPT scores, the effect of bonus points and the City's method of handling ties.

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American and white candidates who have list numbers of 4,825.5 or lower is statistically significant). The disparity is equivalent to 9.74 units of standard deviation. The likelihood of this disparity occurring by chance is infinitesimally small, less than 1-in-4.5 million billion.[26]

In terms of practical effect, as a result of the disparity between the rates at which African Americans and whites pass the "ranking test," 95 African-American candidates have not ranked high enough to be appointed to date. An estimated 42 of the 95 would have been appointed as FDNY firefighters to date. The ratio of the African-American pass rate on the "ranking test" to the white pass rate is 67.6%.[27]

    c. Effect of Delay in Appointment of African-American Firefighters

Because appointments from among qualified candidates are made in rank order, on average, African-American candidates are reached on the list for possible appointment later than white candidates. As a result, the rank-order process also has delayed the appointment of some African-American candidates who have been appointed from Exam 2043. This delay effect is shown in Table 12. Table 12 Part B shows that, to date, the appointments of 44 African-American firefighters from Exam 2043 were delayed due to the disparate impact of the rank-order process. As a result, these 44

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[26] If, before May 2008, when the Exam 2043 eligibility list expires, the City were to appoint candidates down to 1,000 candidates below the last candidate currently appointed, the disparity between the rates at which African Americans and whites would pass the "ranking test" would remain highly statistically significant. As shown in Table 11, the disparity would be equivalent to 9.78 units of standard deviation.

[27] Table 11 shows the comparable shortfalls and the ratio of the rate at which African Americans would pass the "ranking test" to the rate at which whites would pass the "ranking test" assuming the City were to reach 400, 800 and 1,000 candidates further down the Exam 2043 eligibility list before the list expired in May 2008. If the City were to reach 1,000 more candidates, the shortfall in African-American candidates reached would be 89, and the shortfall in appointments would be an estimated 37 African Americans. The ratio of the African-American and white pass rates would be 75.9%.

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African-American firefighters have lost a total of approximately 14 years and 1 month of wages and seniority. Each of the 44 has lost, on average, approximately 4 months of wages and seniority.

>   2.   The City's Rank-Order Processing/Selection of Candidates Based on a Combination of Written Exam 2043 and PPT Scores Has Resulted in a Disparate Impact upon Hispanic Candidates

>>   a.   The City's Method of Ranking Candidates Based on a Combination of Written Exam 2043 and PPT Scores Has Resulted in Disproportionately Low Ranks for Hispanic Candidates

The Mann-Whitney Rank Sum Test shows that Hispanics are ranked statistically significantly lower than whites on the Exam 2043 eligibility list. The disparity between Hispanic and white ranks is equivalent to 4.55 units of standard deviation. The likelihood of such a disparity occurring by chance is infinitesimally small, less than 1-in-186,225.

>>   b.   Effect of Eliminating Hispanic Candidates from Possible Appointment

Table 13 shows that the disparity in ranking "pass rates" between Hispanics and whites is statistically significant (*i.e.*, the disparity between the percentages of Hispanic and white candidates who have list numbers of 4,825.5 or lower is statistically significant). The disparity is equivalent to 5.04 units of standard deviation. The likelihood of this disparity occurring by chance is less than 1-in-2 million.[28]

In terms of practical effect, as a result of the disparity between the rates at which Hispanics and whites pass the "ranking test," 63 Hispanic candidates have not ranked high enough to be

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[28]   If, before May 2008, when the Exam 2043 eligibility list expires, the City were to appoint candidates down to 1,000 candidates below the last candidate currently appointed, the disparity between the rates at which Hispanics and whites would pass the "ranking test" would remain statistically significant. As shown in Table 13, the disparity between the Hispanic and white pass rates would be equivalent to 4.03 units of standard deviation. The likelihood of this disparity occurring by chance is less than 1-in-17,920.

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appointed to date. An estimated 28 of them would have been appointed as FDNY firefighters to date.

The ratio of the Hispanic pass rate on the "ranking test" to the white pass rate is 86.9%.[29]

c.   Effect of Delay in Appointment of Hispanic Firefighters

Because appointments from among qualified candidates are made in rank order, on average, Hispanic candidates are reached on the list for possible appointment later than white candidates. As a result, the rank-order process has delayed the appointment of some Hispanic candidates who have been appointed. This delay effect is shown in Table 14. Table 14 Part B shows that, to date, the appointments of 51 Hispanic firefighters appointed from Exam 2043 were delayed due to the disparate impact of the rank-order process. As a result, these 51 Hispanic firefighters have lost a total of approximately 12 years and 4 months of wages and seniority. Each of the 51 has lost, on average, approximately 3 months of wages and seniority.

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[29]   Table 13 shows the comparable shortfalls and the ratio of the rate at which Hispanics would pass the "ranking test" to the rate at which whites would pass the "ranking test" assuming the City were to reach 400, 800 and 1,000 candidates further down the Exam 2043 eligibility list before the list expired in May 2008. If the City were to reach 1,000 more candidates, the shortfall in Hispanic candidates reached would be 43, and the shortfall in appointments would be an estimated 19 Hispanics. The ratio of the Hispanic and white pass rates would be 92.3%.

TABLE 1

DISPARATE IMPACT
ON AFRICAN AMERICANS
OF PASS/FAIL USE OF WRITTEN EXAMINATION

EXAM 7029

	WHITE	AFRICAN-AMERICAN
Test Takers	12,915	1,749
Test Passers[1]	11,613	1,054
Pass Rate	89.92%	60.26%

Difference in pass rate by race:

In units of standard deviation[2]	33.9
Likelihood of as large a disparity occurring by chance	1-in-4.5 million billion

Shortfall in African-American test passers	519

Estimated shortfall in African-American appointments	114

Ratio of African-American pass rate to white pass rate (80% Rule)	67.0%

NOTES

[1]   Scoring 84.705 or higher on written examination

[2]   Based on Yates Corrected Chi-Square calculation

<div align="right">**TABLE 2**</div>

<div align="center">

**DISPARATE IMPACT
ON HISPANICS
OF PASS/FAIL USE OF WRITTEN EXAMINATION**

EXAM 7029

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	WHITE	HISPANIC
Test Takers	12,915	2,126
Test Passers[1]	11,613	1,630
Pass Rate	89.92%	76.67%

Difference in pass rate by national origin:

    In units of standard deviation[2]   17.41

    Likelihood of as large a disparity occurring by chance   1-in-4.5 million billion

Shortfall in Hispanic test passers   282

Estimated shortfall in Hispanic appointments   62

Ratio of Hispanic pass rate to white pass rate
    (80% Rule)   85.3%

<div align="center">**NOTES**</div>

[1]   Scoring 84.705 or higher on written examination

[2]   Based on Yates Corrected Chi-Square calculation

<div align="right">
<u>TABLE 3</u>
PART A
</div>

IMPACT OF RANKING
ON TIME TO APPOINTMENT OF AFRICAN AMERICANS

<u>EXAM 7029</u>

APPOINTMENT DATE	AFRICAN-AMERICAN APPOINTMENTS		SHORTFALL[3]
	ACTUAL[1]	EXPECTED[2]	
02/04/01	2	5	3
05/06/01	1	3	2
07/15/01	1	5	4
10/28/01	10	10	0
01/27/02	12	9	-3
05/06/02	8	10	2
07/28/02	14	9	-5
02/02/03	6	9	3
05/04/03	10	11	1
09/14/03	13	7	-6
12/10/03	6	9	3
03/07/04	4	8	4
05/25/04	8	5	-3
9/12/2004[4]	9	4	-5
TOTAL	104	104	0

<u>NOTES</u>

[1] Based on actual appointment dates

[2] If appointment dates were statistically independent of race, rounded to whole person

[3] Negative shortfall means surplus of African-American appointments

[4] Appointment date 9/12/2004 means on or after that date

TABLE 3
PART B

IMPACT OF RANKING
ON TIME TO APPOINTMENT OF AFRICAN AMERICANS

EXAM 7029

APPOINTMENT DATE	NUMBER OF AFRICAN-AMERICAN APPOINTMENTS[1]	DATE SHOULD HAVE BEEN APPOINTED	LOST YEARS OF WAGES/SENIORITY PER PERSON	TOTAL LOST YEARS OF WAGES/SENIORITY[2]
02/04/01	2	02/04/01	0.00	0.00
05/06/01	1	02/04/01	0.25	0.25
07/15/01	1	02/04/01	0.44	0.44
10/28/01	1	02/04/01	0.73	0.73
10/28/01	3	05/06/01	0.48	1.44
10/28/01	5	07/15/01	0.29	1.44
10/28/01	1	10/28/01	0.00	0.00
01/27/02	9	10/28/01	0.25	2.24
01/27/02	3	01/27/02	0.00	0.00
05/06/02	6	01/27/02	0.27	1.63
05/06/02	2	05/06/02	0.00	0.00
07/28/02	8	05/06/02	0.23	1.82
07/28/02	6	07/28/02	0.00	0.00
02/02/03	3	07/28/02	0.52	1.55
02/02/03	3	02/02/03	0.00	0.00
05/04/03	6	02/02/03	0.25	1.50
05/04/03	4	05/04/03	0.00	0.00
09/14/03	7	05/04/03	0.36	2.55
09/14/03	6	09/14/03	0.00	0.00
12/10/03	1	09/14/03	0.24	0.24
12/10/03	5	12/10/03	0.00	0.00
03/07/04	4	12/10/03	0.24	0.96
05/25/04	8	03/07/04	0.22	1.73
09/12/04	5	05/25/04	0.30	1.51
09/12/04	4	09/12/04	0.00	0.00
TOTAL	104			20.03
DELAYED	68			

AVERAGE LOST YEARS OF WAGES/SENIORITY
PER DELAYED AFRICAN AMERICAN   0.29   (3.48 MONTHS)

NOTES

[1] Based on actual appointment dates

[2] Total lost years of wages/seniority (which is the product of the number of African-American appointments times the lost years of wages/seniority per person) may not appear equal due to rounding

TABLE 4
PART A

IMPACT OF RANKING
ON TIME TO APPOINTMENT OF HISPANICS

EXAM 7029

APPOINTMENT DATE	HISPANIC APPOINTMENTS		SHORTFALL[3]
	ACTUAL[1]	EXPECTED[2]	
02/04/01	10	12	2
05/06/01	6	8	2
07/15/01	10	13	3
10/28/01	22	26	4
01/27/02	27	25	-2
05/06/02	28	26	-2
07/28/02	29	24	-5
02/02/03	21	23	2
05/04/03	24	30	6
09/04/03	24	19	-5
12/10/03	22	23	1
03/07/04	16	20	4
05/25/04	14	13	-1
9/12/2004[4]	21	12	-9
TOTAL	274	274	0

NOTES

[1] Based on actual appointment dates

[2] If appointment dates were statistically independent of race, rounded to whole person

[3] Negative shortfall means surplus of Hispanic appointments

[4] Appointment date 9/12/2004 means on or after that date

TABLE 4
PART B

IMPACT OF RANKING
ON TIME TO APPOINTMENT OF HISPANICS

EXAM 7029

APPOINTMENT DATE	NUMBER OF HISPANIC APPOINTMENTS[1]	DATE SHOULD HAVE BEEN APPOINTED	LOST YEARS OF WAGES/SENIORITY BY PERSON	TOTAL LOST YEARS OF WAGES/SENIORITY[2]
02/04/01	10	02/04/01	0.00	0.00
05/06/01	2	02/04/01	0.25	0.50
05/06/01	4	05/06/01	0.00	0.00
07/15/01	4	05/06/01	0.19	0.77
07/15/01	6	07/15/01	0.00	0.00
10/28/01	7	07/15/01	0.29	2.01
10/28/01	15	10/28/01	0.00	0.00
01/27/02	11	10/28/01	0.25	2.74
01/27/02	16	01/27/02	0.00	0.00
05/06/02	9	01/27/02	0.27	2.44
05/06/02	19	05/06/02	0.00	0.00
07/28/02	7	05/06/02	0.23	1.59
07/28/02	22	07/28/02	0.00	0.00
02/02/03	2	07/28/02	0.52	1.04
02/02/03	19	02/02/03	0.00	0.00
05/04/03	4	02/02/03	0.25	1.00
05/04/03	20	05/04/03	0.00	0.00
09/04/03	10	05/04/03	0.34	3.37
09/04/03	14	09/04/03	0.00	0.00
12/10/03	5	09/04/03	0.27	1.33
12/10/03	17	12/10/03	0.00	0.00
03/07/04	6	12/10/03	0.24	1.45
03/07/04	10	03/07/04	0.00	0.00
05/25/04	10	03/07/04	0.22	2.16
05/25/04	4	05/25/04	0.00	0.00
09/12/04	9	05/25/04	0.30	2.71
09/12/04	12	09/12/04	0.00	0.00
TOTAL	274			23.11
DELAYED	86			

AVERAGE LOST YEARS OF WAGES/SENIORITY
PER DELAYED HISPANIC   0.27   (3.24 MONTHS)

NOTES

[1] Based on actual appointment dates

[2] Total lost years of wages/seniority (which is the product of the number of Hispanic appointments times the lost years of wages/seniority per person) may not appear equal due to rounding

<div align="right"><u>**TABLE 5**</u></div>

DISPARATE IMPACT
ON AFRICAN AMERICANS
OF PASS/FAIL USE OF WRITTEN EXAMINATION

<u>**EXAM 2043**</u>

	<u>WHITE</u>	<u>AFRICAN-AMERICAN</u>
Test Takers	13,878	1,393
Test Passers[1]	13,496	1,190
Pass Rate	97.25%	85.43%

Difference in pass rate by race:

    In units of standard deviation[2]   21.84

    Likelihood of as large a disparity occurring by chance   1-in-4.5 million billion

Shortfall in African-American test passers   165

Current estimated shortfall in African-American appointments   30

Ratio of African-American pass rate to white pass rate

    (80% Rule)   87.8%

<u>**NOTES**</u>

[1]   Scoring 70.588 or higher on written examination

[2]   Based on Yates Corrected Chi-Square calculation

<div align="right"><u>**TABLE 6**</u></div>

<div align="center">

**DISPARATE IMPACT
ON HISPANICS
OF PASS/FAIL USE OF WRITTEN EXAMINATION**

<u>**EXAM 2043**</u>

</div>

	<u>WHITE</u>	<u>HISPANIC</u>
Test Takers	13,878	2,123
Test Passers[1]	13,496	1,971
Pass Rate	97.25%	92.84%

Difference in pass rate by national origin:

    In units of standard deviation[2]   10.46

    Likelihood of as large a disparity occurring by chance   1 -in-4.5 million billion

Shortfall in Hispanic test passers   94

Current estimated shortfall in Hispanic appointments   17

Ratio of Hispanic pass rate to white pass rate
    (80% Rule)   95.5%

<div align="center"><u>**NOTES**</u></div>

[1]   Scoring 70.588 or higher on written examination

[2]   Based on Yates Corrected Chi-Square calculation

<div align="right">**TABLE 7**</div>

DISPARATE IMPACT
ON AFRICAN AMERICANS
OF WRITTEN EXAMINATION AT EFFECTIVE CUTOFF SCORE

EXAM 2043

	WHITE	AFRICAN-AMERICAN
Test Takers	13,878	1,393
Effective Passers	9,758	578
Effective Pass Rate	70.31%	41.49%

Current difference in effective pass rate by race:

In units of standard deviation[1]	21.89
Likelihood of as large a disparity occurring by chance	1-in-4.5 million billion

Current shortfall in African-American effective test passers — 401

Current estimated shortfall in African-American appointments — 70

Ratio of African-American effective pass rate to white effective pass rate
(80% Rule) — 59.0%

NOTES

[1]   Based on Yates Corrected Chi-Square calculation

TABLE 8

DISPARATE IMPACT ON AFRICAN AMERICANS OF WRITTEN EXAM 2043
ASSUMING ADDITIONAL CANDIDATES ARE REACHED ON ELIGIBILITY LIST
FOR POSSIBLE APPOINTMENT

NUMBER OF CANDIDATES REACHED ON LIST	EFFECTIVE PASS RATE		DISPARITY IN UNITS OF STANDARD DEVIATION	RATIO OF PASS RATES (80% RULE)	SHORTFALL IN EFFECTIVE PASSERS
	WHITE	AFRICAN-AMERICAN			
5,262 (400 more)	74.82%	46.52%	22.46	62.2%	394
5,662 (800 more)	79.36%	53.27%	22.02	67.1%	363
5,862 (1,000 more)	82.43%	57.21%	22.44	69.4%	351

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TABLE 9

</div>

DISPARATE IMPACT
ON HISPANICS
OF WRITTEN EXAMINATION AT EFFECTIVE CUTOFF SCORE

EXAM 2043

	WHITE	HISPANIC
Test Takers	13,878	2,123
Effective Passers	9,758	1,251
Effective Pass Rate	70.31%	58.93%

Current difference in effective pass rate by national origin:

In units of standard deviation[1]   10.52

Likelihood of as large a disparity occurring by chance   1-in-4.5 million billion

Current shortfall in Hispanic effective test passers   242

Current estimated shortfall in Hispanic appointments   45

Ratio of Hispanic effective pass rate to white effective pass rate
(80% Rule)   83.8%

NOTE

[1]   Based on Yates Corrected Chi-Square calculation

TABLE 10

**DISPARATE IMPACT ON HISPANICS OF WRITTEN EXAM 2043
ASSUMING ADDITIONAL CANDIDATES ARE REACHED ON ELIGIBILITY LIST
FOR POSSIBLE APPOINTMENT**

NUMBER OF CANDIDATES REACHED ON LIST	EFFECTIVE PASS RATE		DISPARITY IN UNITS OF STANDARD DEVIATION	RATIO OF PASS RATES (80% RULE)	SHORTFALL IN EFFECTIVE PASSERS
	WHITE	HISPANIC			
5,262 (400 more)	74.82%	63.54%	10.92	84.9%	239
5,662 (800 more)	79.36%	68.96%	10.75	86.9%	221
5,862 (1,000 more)	82.43%	72.63%	10.71	88.1%	207

TABLE 11

IMPACT OF RANKING ON APPOINTMENT OF AFRICAN AMERICANS

EXAM 2043

NUMBER OF CANDIDATES REACHED ON LIST		"RANKING TEST" PASS RATE[1]		DISPARITY IN UNITS OF STANDARD DEVIATION	RATIO OF PASS RATES (80% RULE)	SHORTFALL IN	
		WHITE	AFRICAN-AMERICAN			REACHED FOR POSSIBLE APPOINTMENT	ESTIMATED HIRES DUE TO RANKING
CURRENT:	4862	68.68%	46.41%	9.74	67.6%	95	42
(400 more):	5262	72.62%	51.20%	9.71	70.5%	91	40
(800 more):	5662	78.16%	58.17%	9.72	74.4%	85	37
(1,000 more):	5862	80.40%	61.00%	9.78	75.9%	83	30

NOTE

[1] Ranking high enough on eligibility list to be reached for possible appointment

TABLE 12
PART A

IMPACT OF RANKING
ON TIME TO APPOINTMENT OF AFRICAN AMERICANS

EXAM 2043

APPOINTMENT DATE	AFRICAN-AMERICAN APPOINTMENTS		
	ACTUAL[1]	EXPECTED[2]	SHORTFALL[3]
05/25/04	0	1	1
09/12/04	0	2	2
12/05/04	2	6	4
03/08/05	12	9	-3
05/31/05	3	9	6
09/25/05	12	6	-6
01/15/06	3	4	1
04/11/06	8	6	-2
06/11/06	5	7	2
11/19/06	7	8	1
03/25/07	17	11	-6
08/05/07	11	11	0
TOTAL	80	80	0

NOTE

[1] Based on actual appointment dates

[2] If appointment dates were statistically independent of race, rounded to whole person

[3] Negative shortfall means surplus of African-American appointments

<div align="right">

TABLE 12
PART B

</div>

IMPACT OF RANKING
ON TIME TO APPOINTMENT OF AFRICAN AMERICANS

EXAM 2043

APPOINTMENT DATE	NUMBER OF AFRICAN-AMERICAN APPOINTMENTS[1]	DATE SHOULD HAVE BEEN APPOINTED	LOST YEARS OF WAGES/SENIORITY PER PERSON	TOTAL LOST YEARS OF WAGES/SENIORITY[2]
12/05/04	1	05/25/04	0.53	0.53
12/05/04	1	09/12/04	0.23	0.23
03/08/05	1	09/12/04	0.48	0.48
03/08/05	6	12/05/04	0.25	1.53
03/08/05	5	03/08/05	0.00	0.00
05/31/05	3	03/08/05	0.23	0.69
09/25/05	1	03/08/05	0.55	0.55
09/25/05	9	05/31/05	0.32	2.88
09/25/05	2	09/25/05	0.00	0.00
01/15/06	3	09/25/05	0.31	0.92
04/11/06	1	09/25/05	0.54	0.54
04/11/06	4	01/15/06	0.24	0.94
04/11/06	3	04/11/06	0.00	0.00
06/11/06	3	04/11/06	0.17	0.50
06/11/06	2	06/11/06	0.00	0.00
11/19/06	5	06/11/06	0.44	2.21
11/19/06	2	11/19/06	0.00	0.00
03/25/07	6	11/19/06	0.35	2.07
03/25/07	11	03/25/07	0.00	0.00
08/05/07	11	08/05/07	0.00	0.00
TOTAL	80			14.08
DELAYED	44			

AVERAGE LOST YEARS OF WAGES/SENIORITY PER
DELAYED AFRICAN AMERICAN   0.32   (3.84 MONTHS)

NOTES

[1] Based on actual appointment dates

[2] Total lost years of wages/seniority (which is the product of the number of African-American appointments times the lost years of wages/seniority per person) may not appear equal due to rounding

TABLE 13

IMPACT OF RANKING ON APPOINTMENT OF HISPANICS

EXAM 2043

NUMBER OF CANDIDATES REACHED ON LIST		"RANKING TEST" PASS RATE[1]		DISPARITY IN UNITS OF STANDARD DEVIATION	RATIO OF PASS RATES (80% RULE)	SHORTFALL IN	
		WHITE	AFRICAN AMERICAN			REACHED FOR POSSIBLE APPOINTMENT	ESTIMATED HIRES DUE TO RANKING
CURRENT:	4862	68.68%	59.67%	5.04	86.9%	63	28
(400 more):	5262	72.62%	63.87%	5.08	88.0%	61	27
(800 more):	5662	78.16%	70.87%	4.55	90.7%	51	22
(1,000 more):	5862	80.40%	74.17%	4.03	92.3%	43	19

NOTE

[1] Ranking high enough on eligibility list to be reached for possible appointment

<div align="right">

TABLE 14
PART A

</div>

IMPACT OF RANKING
ON TIME TO APPOINTMENT OF HISPANICS

EXAM 2043

APPOINTMENT DATE	HISPANIC APPOINTMENTS		SHORTFALL[3]
	ACTUAL[1]	EXPECTED[2]	
05/25/04	1	2	1
09/12/04	2	4	2
12/05/04	9	13	4
03/08/05	11	20	9
05/31/05	28	22	-6
09/25/05	19	15	-4
01/15/06	9	10	1
04/11/06	25	16	-9
06/11/06	15	16	1
11/19/06	16	18	2
03/25/07	27	25	-2
08/05/07	25	26	1
TOTAL	187	187	0

NOTES

[1] Based on actual appointment dates

[2] If appointment dates were statistically independent of national origin, rounded to whole perso

[3] Negative shortfall means surplus of Hispanic appointments

<div align="right">

TABLE 14
PART B

</div>

IMPACT OF RANKING
ON TIME TO APPOINTMENT OF HISPANICS

EXAM 2043

APPOINTMENT DATE	NUMBER OF HISPANICS APPOINTMENTS[1]	DATE SHOULD HAVE BEEN APPOINTED	LOST YEARS OF WAGES/SENIORITY PER PERSON	TOTAL LOST YEARS OF WAGES/SENIORITY[2]
05/25/04	1	05/25/04	0.00	0.00
09/12/04	1	05/25/04	0.30	0.30
09/12/04	1	09/12/04	0.00	0.00
12/05/04	3	09/12/04	0.23	0.69
12/05/04	6	12/05/04	0.00	0.00
03/08/05	7	12/05/04	0.25	1.78
03/08/05	4	03/08/05	0.00	0.00
05/31/05	16	03/08/05	0.23	3.68
05/31/05	12	05/31/05	0.00	0.00
09/25/05	10	05/31/05	0.32	3.21
09/25/05	9	09/25/05	0.00	0.00
01/15/06	6	09/25/05	0.31	1.84
01/15/06	3	01/15/06	0.00	0.00
04/11/06	7	01/15/06	0.24	1.65
04/11/06	16	04/11/06	0.00	0.00
04/11/06	2	06/11/06	-0.17	-0.33
06/11/06	14	06/11/06	0.00	0.00
06/11/06	1	11/19/06	-0.44	-0.44
11/19/06	16	11/19/06	0.00	0.00
03/25/07	1	11/19/06	0.35	0.35
03/25/07	25	03/25/07	0.00	0.00
03/25/07	1	08/05/07	-0.36	-0.36
08/05/07	25	08/05/07	0.00	0.00
TOTAL	187			12.36
DELAYED	51			

AVERAGE LOST YEARS OF WAGES/SENIORITY   0.24   (2.88 MONTHS)
PER DELAYED HISPANIC

NOTES

[1] Based on actual appointment dates

[2] Total lost years of wages/seniority (which is the product of the number of Hispanic appointments times the lost years of wages/seniority per person) may not appear equal due to rounding

APPENDIX A

LeCG

Bernard R. Siskin, Ph.D.
Director, LECG

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SUMMARY

Bernard Siskin received his B.S. degree in Mathematics from the University of Pittsburgh and a Ph.D. in Statistics from the University of Pennsylvania. For many years, he taught statistics at Temple University and served as Chairman of the Department of Statistics.

Dr. Siskin has specialized in the application of statistics in law, particularly in the area of analyzing data for statistical evidence of discrimination. He has testified for both plaintiffs and defendants in more than 200 cases, many of which were large employment class actions. In addition to discrimination studies, he has conducted statistical studies and has testified in commercial and environmental cases involving statistical issues.

Dr. Siskin has frequently been appointed by federal judges as a neutral expert to aid the court in statistical issues and he was the statistical consultant to the Third Circuit Court of Appeals Task Force on Equal Treatment in the Courts.

Dr. Siskin is the author of many articles and textbooks on statistics and quantitative techniques including *Elementary Business Statistics, Encyclopedia of Management* and *Quantitative Techniques for Business Decisions*. He has also written and lectured extensively on the use of statistics in litigation.

He has served as a statistical consultant to the U.S. Department of Justice, the Equal Employment Opportunity Commission, the U.S. Department of Labor, the Federal Bureau of Investigation, the Central Intelligence Agency, the Environmental Protection Agency, the National Aeronautics and Space Administration and Fannie Mae (the Federal National Mortgage Association) and Freddie Mac (the Federal Home Loan Mortgage Corporation), as well as numerous other federal, state and city agencies and Fortune Five Hundred corporations.

LECG

EDUCATION
University of Pennsylvania
Ph.D., Statistics (Minor, Econometrics), 1970

University of North Carolina
Graduate Study (Major, Economics; Minor, Statistics), 1966

University of Pittsburgh
B.S., Mathematics (Minor, Economics), 1965

PRESENT POSITION
LECG, Director, 2003 to present

TEACHING EXPERIENCE
Temple University, Adjunct Professor of Law School, 1992 to present
Temple University, Tenured Associate Professor of Statistics, 1973 to 1984
Temple University, Chairman-Department of Statistics, 1973 to 1978
Temple University, Assistant Professor of Statistics, 1970 to 1973
Temple University, Instructor of Statistics, 1968 to 1970

OTHER POSITIONS HELD
Center for Forensic Economic Studies, Senior Vice President, 1991 to 2003
National Economic Research Associates, Inc., Senior Vice President, 1989 to 1991
National Economic Research Associates, Inc., Vice President, 1986 to 1989
Center for Forensic Economic Studies, Ltd., President, 1984 to 1986
Center for Forensic Economic Studies, Ltd., Consultant, 1980 to 1984

PUBLICATIONS
Books
1. B. Siskin, "Employment Discrimination Litigation: Behavioral, Quantitative, and Legal Perspectives" John Wiley & Sons, Inc. 2005, Chapter 5 *Statistical Issues in Litigation* (with Joseph Trippi).
2. B. Siskin, "Use of Statistical Models to Provide Statistical Evidence of Discrimination in the Treatment of Mortgage Loan Applicants: A Study of One Lending Institution," *Mortgage Lending, Racial Discrimination and Federal Policy*, Urban Institute Press, 1996, J. Goering and R. Wienk, eds.
3. B. Siskin and J. Staller, *What Are The Chances?*, Crown Publishers, 1989.
4. B. Siskin and R. Johnson, *Elementary Statistics: A First Course*, Duxbury Press, 1982.

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PUBLICATIONS (Continued)
Books (Continued)

5. B. Siskin and R. Johnson, *Elementary Business Statistics*, Duxbury Press, 1979 2nd Edition, 1985
6. B. Siskin, *Encyclopedia of Management*, McGraw Hill, 1979. (Ed. Les Bechtel).
7. B. Siskin and R. Johnson, *Quantitative Techniques for Business Decisions*, Prentice Hall, 1976.

Articles

1. B. Siskin and D. Griffin, "Litigating Employment Discrimination & Sexual Harassment Claims," *Litigation Handbook Series*, 2002.
2. B. Siskin, H. Carter, V. Lee, G. Page, M. Parker, R.G. Ford, G. Swartzman, S. Kress, S. Singer and D.M. Fry, "The 1986 Apex Houston Oil Spill in Central California: Seabird Mortality and Population Impacts, Injury Assessments, Litigation Process, and Initial Restoration Efforts," *Marine Ornithology*, 2002.
3. B. Siskin, "Utilizing Statistics in Discrimination Cases," *Litigation Handbook Series*, 2001.
4. B. Siskin, B. Sullivan, J. Staller, and E. Hull, "Defending and Proving Damages in Employment Discrimination Cases," *Litigation Handbook Series*, 2000.
5. B. Siskin, "Litigating Employment Discrimination Cases," *Litigation Handbook Series*, 1998.
6. B. Siskin and D. Kahn, "Litigating Employment Discrimination Cases," *Litigation Handbook Series*, 1997.
7. B. Siskin, R. DuPont, D. Griffin, S. Shiraki, and E. Katze "Random Workplace Drug Testing. Does It Primarily Identify Casual or Regular Drug Users?," *Employment Testing Law & Policy Reporter*, Vol. 4, Number One, 1995.
8. B. Siskin, R. DuPont, D. Griffin, S. Shiraki, and E. Katze "Random Drug Tests at Work: The Probability of Identifying Frequent and Infrequent Users of Illicit Drugs," *Journal of Addictive Diseases*, Vol. 14, Number 3, 1995.
9. B Siskin, J. Staller, B. Sullivan and L. Freifelder, "Litigating Employment Discrimination Cases," *Litigation Course Handbook Series*, 1995.
10. B. Siskin, "Comparing the Role of Statistics In Lending and Employment Cases," *Fair Lending Analysis: A Compendium of Essays on the Use of Statistics*, American Bankers Association, 1995.
11. B. Siskin, "Relationship Between Performance and Banding," *Human Performance*, Vol. 8, No. 3, July 1995.
12. B. Siskin, "Statistical Issues in Litigating Employment Discrimination Claims," *Federal Publications*, 1993.
13. B. Siskin, "Use of Statistical Models to Provide Statistical Evidence of Discrimination in the Treatment of Mortgage Loan Applicants: A Study of One Lending Institution," *Discrimination and Mortgage Lending Research and Enforcement Conference* Department of Housing and Urban Development, May 1993.

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SPEECHES (Partial List)
1. Alabama Bar Association
2. American Bar Association
3. American Statistical Association
4. Defense Research Institute
5. Federal Bar Association
6. Harvard University
7. Institute of Industrial Research
8. International Organization of Human Rights Association
9. Law Education Institute
10. Law Enforcement Assistance Administration
11. Michigan Bar Association
12. National Center on Aging
13. Ohio Bar Association
14. Penn State University
15. Pennsylvania Human Relations Commission
16. Practising Law Institute
17. Security Industry Association
18. Women's Law Caucus: National Conference

STATISTICAL CONSULTANT (Partial List)
1. Attorney General's Office of the Commonwealth of Pennsylvania, and states of California, Oregon, Massachusetts, Connecticut, Mississippi, Louisiana and New Jersey
2. Board of Higher Education for Massachusetts and Oregon
3. Central Intelligence Agency (CIA)
4. Environmental Protection Agency (EPA)
5. Equal Employment Opportunity Commission (EEOC)
6. Federal Bureau of Investigation (FBI)
7. Freddie Mac (Federal Home Loan Mortgage Corporation)
7. Fannie Mae (Federal National Mortgage Association)
8. Homeland Security
9. International Organization of Human Rights Associations
10. Municipal Court of Philadelphia
11. National Aeronautics and Space Administration (NASA)
12. Office of Federal Contract Compliance, Department of Labor (OFCCP)
13. Pennsylvania Human Relations Commission
14. Security Exchange Commission
15. Third Circuit Court of Appeals Task Force on Equal Treatment in the Courts
16. U.S. Department of Agriculture
17. U.S. Department of Commerce
18. U.S. Department of Labor
19. U. S. Justice Department
20. Numerous Fortune 500 and other private corporations

Testimony Listing for Bernard R. Siskin, Ph.D.

Date	Case Name	Location	Activity	On Behalf Of
2007	C. Larsen v. USA et al	Philadelphia, PA	Declaration	Defendant
2007	C. Whitaker, et al v. 3M Company	Philadelphia, PA	Affidavit	Defendant
2007	John Pinkowski et al v. 3 M Company	Philadelphia, PA	Affidavit	Defendant
2007	US v. Chesapeake VA Police Dept	Washington, DC	Deposition	Plaintiff
2006	A. Rochlin et al. v Cincinnati Insurance	Philadelphia, PA	Deposition	Defendant
2006	Brooks, et al. v. Paramount	Philadelphia, PA	Declaration	Defendant
2006	Charles Dudley v. City of Macon GA	Philadelphia, PA	Declaration	Defendant
2006	D Davis v. Kraft Foods North America	Philadelphia, PA	Declaration	Defendant
2006	Dealer Warranty Parts Litigation	Philadelphia, PA	Declaration	Defendant
2006	E. L. Anderson et al. v. The Boeing Company	Philadelphia, PA	Declaration	Plaintiff
2006	Employees Committed Justice v Eastman Kodak	Philadelphia, PA	Deposition	Defendant
2006	Holster v. McMaster-Carr	Philadelphia, PA	Affidavit	Defendant
2006	Jones v. GPU	Philadelphia, PA	Deposition	Defendant
2006	Michael Newton v. Prudential Equity	Boca Raton, FL	Trial	Defendant
2006	Miquel Contreras et al. v.Tom Ridge	Philadelphia, PA	Declaration	Defendant
2006	Nancy Thomas v. Merrill Lynch	New York, NY	Arbitration	Defendant
2006	OneBeacon Ins Co v. Liberty Mutl Ins.	Philadelphia, PA	Deposition	Plaintiff
2006	R. Adair et al. v. USA et al.	Philadelphia, PA	Declaration	Defendant
2006	US v. NY Board of Education et al.	New York, NY	Hearing	Plaintiff
2005	Bednar v. Allstate Insurance	Chicago, IL	Deposition	Plaintiff
2005	Buth-na-Bodhaige v.Yvette Rubery	Philadelphia, PA	Declaration	Defendant
2005	C. Whitaker, et al. v. 3M Company	Philadelphia, PA	Affidavit	Defendant
2005	EEOC v. SEC and NTEU	Washington, DC	Hearing	Defendant
2005	EEOC v. WilliamsHouse	Philadelphia, PA	Affidavit	Defendant
2005	Individuals v. Fluor Fernald Inc.	Philadelphia, PA	Affidavit	Defendant
2005	Keepseagle v. Veneman	Philadelphia, PA	Declaration	Defendant
2005	P. Boord v. John Ashcroft et al.	Philadelphia, PA	Affidavit	Defendant
2005	SEC & NTEU/EEOC	Washington, DC	Hearing	Defendant
2005	US v. City of Erie PA	Erie, PA	Testimony	Plaintiff
2005	Valenzuela v. O'Neill	Philadelphia, PA	Declaration	Defendant
2004	Boebel v. Combined Insurance	Chicago, IL	Deposition	Defendant
2004	C. Schermer et al v. State Farm Fire et al	Philadelphia, PA	Affidavit	Plaintiff
2004	Cynthia McReynolds v. Sodexho Marriott	Philadelphia, PA	Declaration	Plaintiff
2004	EEOC v Local 28	New York, NY	Hearing	
2004	Flowers v. ADP Claims Solutions, et al.	Cook County, IL	Declaration	Defendant
2004	J. Guttierez et al v. State Farm Mutual Ins.	Philadelphia, PA	Declaration	Plaintiff
2004	Jarvis C. Jones v. The St. Paul Companies	Philadelphia, PA	Deposition	Defendant
2004	Jesus Malave v. Potter	Philadelphia, PA	Deposition	Defendant
2004	K. Carpenter et al. v. The Boeing Company	Philadelphia, PA	Deposition	Plaintiff
2004	K. Nouri et al. v. The Boeing Company	Seattle, WA	Trial	Plaintiff
2004	Loranger v. Merrill Lynch	Portland, ME	Trial	Defendant
2004	Mary Beck et al. v. The Boeing Company	Washington, DC	Deposition	Plaintiff
2004	National Fair Housing v. Prudential Insurance	Philadelphia, PA	Deposition	Plaintiff
2004	R. Greenway v. Mitsubishi	Philadelphia, PA	Deposition	Defendant
2004	Sims et al. v. Allstate Ins.	St. Louis, MO	Trial	Plaintiff
2004	Twombly v. Merrill Lynch	Chicago, Il	Hearing	Defendant
2004	Univision v. Nielson	Los Angeles, CA	Declaration	Defendant
2004	Williams v. Boeing	Philadelphia, PA	Declaration	Plaintiff

Testimony Listing for Bernard R. Siskin, Ph.D.

Date	Case Name	Location	Activity	On Behalf Of
2004	Wyatt v. Merrill Lynch	Fort Myers, FL	Hearing	Defendant
2004	Z. Wachtel et al v. Guardian Life Ins. et al	Philadelphia, PA	Deposition	Plaintiff
2003	EEOC v. Target	Philadelphia, PA	Deposition	Defendant
2003	Farina v. Iberia Airlines	Miami, FL	Trial	Defendant
2003	Hydie Sumner v. Merrill Lynch	San Antonio, TX	Trial	Defendant
2003	Sonia Ingram v. Merrill Lynch	New York, NY	Trial	Defendant

A P P E N D I X   B

APPENDIX B

Complaint

Answer

Scheduling Order

Revised Scheduling Order

Defendant City of New York's Responses to Plaintiff's First Set of Interrogatories

Defendant City of New York's Responses to Plaintiff's First Requests for Production of Documents

Plaintiffs-Intervenors' Second Set of Interrogatories

CERTS Reference Table Listing Action Codes

Notice of Examination for Exam No. 7029 (third amended)

Memory Booklet and Question Booklet for Firefighter Exam No. 7029 (p.m. version)

Answer Key for Written Exam 7029 (p.m. version)

Notice of Examination for Exam 2043 (second amended)

Memory Booklet and Question Booklet for Firefighter Exam No. 2043 (a.m. version)

Answer Key for Written Exam 2043 (a.m. version)

Notice of Examination for Exam. No. 6019 (second amended)

Test Development Report, Firefighter Exam No. 7029, by Matthew Morrongiello

Final Report, Physical Performance Test, September 1999, SHL Landy Jacobs, Inc.

Documents Bates numbered EEPC 0058-78, EEPC 088-105, EEPC 0109-158, EEPC 0163-181, EEPC 196-202 and EEPC 0302-334

Letter to E. Yourke from G. Pestana, dated 1/9/04

Letter to B. Thawley from G. Pestana, dated 7/12/05

Letter to A. Schilling from G. Pestana, dated 11/25/05

Letter to B. Thawley from G. Pestana, data 2/14/06

Letter to S. Seeley from G. Pestana, dated 9/13/07

Transcript of Rule 30(b)(6) Deposition of City, by designee T. Patitucci

Transcript of Rule 30(b)(6) Deposition of City, by designee S. Dobrowsky

Transcript of Rule 30(b)(6) Deposition of City, by designee D. Tow

Diskette labeled "FF Eligible Lists 7029,7514, 4532, 0532 with dispositions as of 11/25/05"

Diskette labeled "FF Eligible List 2043 with dispositions as of 11/25/05"

Diskette labeled "Eligible List 2043 as of 9/07 DCAS 000020 D.R. 24"

CD labeled "Applicant Data 7029 and 2043"

CD labeled "Exam 7029 Corrected Applicant Data"

CD labeled "2043 Corrected."

CD labeled "7029 Appt. Dates + CFR-D"

CD labeled "2043 Appt. Dates"

CD labeled "FDNY Human Resources Information System"

CD labeled "CID 2043 & 7029 8/22/07"

CD labeled "Defendant's Responses to the United States' 1st Request for Production and Set of Interrogatories" (Containing documents Bates Numbered USA 1188-1196, USA 1426-1437, USA 1475-1483, USA 2558-2577, USA 4296-4311, USA 4811-4918, USA 4929-4936, USA 6256-6286, USA 6287-6431, USA 6747-6748, USA 415, USA 417-436, USA 840, USA 2408 -2517, USA 2746-2747, USA 2836-2837, USA 2839-3217, USA 3933-3994, USA 3997-4002, USA 4312-4313, USA 4316-4330, USA 4333-4338, USA 4339-4355, USA 2673-2712, USA 3218, USA 3223-3225, USA 3228-3255, and USA 4250-4295)

A P P E N D I X   C

APPENDIX C

DATA INCONSISTENCIES

For a handful of candidates, the data provided by the City on the CDs labeled "Exam 7029 Corrected Applicant Data" and "2043 Corrected" was not consistent. There were several cases in which the components of the candidate's Adjusted Final Average (*i.e.*, the written examination score, the PPT score and bonus points) did not "add up" to the Adjusted Final Average reported in the data. In other words, for several candidates, the Adjusted Final Average in the data did not match the Adjusted Final Average I calculated from the candidate's written examination and PPT scores and bonus points, using the method provided by the City and set forth in Appendix D and Appendix E . There were three such cases for Exam 7029 and 28 such cases for Exam 2043.

In a few of these cases, the combined scores based on the written examination and PPT scores were slightly inconsistent. That is, a few candidates had combined scores in the applicant data that were slightly different than the combined scores of other candidates with the same written examination and PPT scores. These inconsistencies may be due to the fact that some score calculations done after the main administration and scoring of Exam 7029 or Exam 2043 were done by hand rather than by computer (*See* Rule 30(b)(6) Deposition Testimony of the City (S. Dobrowsky designee), pp. 51-54), as the hand calculations might differ from the computer computations due to differences in rounding or slight computational errors. I understand that one indication that calculations for a particular candidate may have been done after the main administration and scoring is that the candidate's list number is not a whole number (*i.e.*, it is, for example, 1234.5 or 5678.7), indicating that the candidate was inserted between two other candidates after the eligibility list was first prepared. While the differences in combined score are slight, I have adjusted the data to correct

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these computational errors for all analyses except those in which I use list number/rank. I also adjusted the data by removing one record that appeared to be a duplicate (*i.e.*, the candidate's identifying information, including Social Security number, was the same on both records). All such adjustments are listed below. When I use list number/rank, I use the list number provided in the applicant data even if it appears to be based on an erroneous computation of a candidate's Adjusted Final Average, because that is the list number used by the City. Because many candidates have tied scores, the slight differences in combined scores that appear to be due to computational errors could make a difference of several hundred places (*i.e.*, list numbers) on the eligibility list.

In addition, the data for Exam 2043 indicates that five points were awarded for Legacy Credit, but the Adjusted Final Averages of candidates eligible for Legacy Credit indicate that ten points actually were awarded for Exam 2043. Based on the deposition testimony of Thomas Patitucci, testifying as the City's Rule 30(b)(6) designee, I understand that, in fact, the number of points awarded for Legacy Credit was increased to ten points for Exam 2043. *See* Rule 30(b)(6) Deposition Testimony of the City (T. Patitucci designee), pp. 148-151. Therefore, in my analyses I have treated candidates awarded Legacy Credit for Exam 2043 as having received ten bonus points.

There also were a few cases in which the Disposition Action Codes for a candidate provided in the applicant data appeared to be inconsistent with the Investigative Description in the data contained on the CD provided by the City labeled "CID 2043 + 7029 9/22/07." The cases in which the CID Investigative Description and the applicant data Disposition Action Codes were inconsistent are listed below. For a few candidates, the Disposition Action Codes indicate that the candidate was appointed (or offered an appointment and declined) either the first or last time the candidate was certified, while the CID Investigative Description does not indicate that the candidate was appointed

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(or offered an appointment and declined). Based on the deposition testimony, I understand that, in some cases, a candidate was appointed, left for some reason, and later was re-certified and not appointed from that later certification. *See* Rule 30(b)(6) Deposition Testimony by the City (S. Dobrowsky, designee), pp. 99-100). In that case, the CID Investigative Description may not indicate that the candidate ever was appointed, because the CID Investigative Description was updated. *See* Rule 30(b)(6) Deposition Testimony by the City (S. Tow, designee), pp. 75-78 and 100-101). This appears to be the explanation when the Disposition Action Code in the applicant data for a candidate's first certification indicates that the candidate was appointed and the Disposition Action Code for the candidate's last certification indicates that he/she was not. There also are a few cases in which the CID Investigative Description indicates that a candidate was appointed and the Disposition Action Codes in the applicant data do not. In determining the number or estimated number of appointments for my analyses, I consider a candidate as appointed if either the applicant data or CID investigative data indicated the candidate was appointed. However, I have relied on the applicant data for purposes of determining the highest list number appointed from Exam 2043. In the applicant data, the highest list number of any candidate appointed or offered appointment is 4825.5. In the CID data, there are three candidates with list numbers above 4825.5 who have a CID "Investigation Disposition" indicating that they have been appointed. Given the list numbers of these individuals (5505, 5747 and 6554), if they were appointed, they apparently were not appointed in list number order from the Exam 2043 eligibility list. In the applicant data, I counted Disposition Action Codes of "APP" only, not "AOL" or "AOX," as appointments because it is my understanding that the latter two codes indicate that a candidate was appointed from another eligibility list. *See* Rule 30(b)(6) Deposition Testimony by the City (S. Dobrowsky, designee), pp. 111) and Rule 30(b)(6)

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Deposition Testimony by the City (D. Tow, designee), p. 132).

I understand that data responsive to the United States' discovery requests but not yet provided by the City contains additional information about candidates' certification history, including a candidate's disposition each time the candidate was certified and any notes of CID investigators that may explain the certification/disposition history of the candidate. To the extent that such data becomes available to me, I may amend or supplement my report to reflect the additional information provided.

APPENDIX C-7029

INCONSISTENCIES FOR EXAM 7029

SOCIAL SECURITY NO	NAME	RACE/ ETHNICITY	AVERAGE SCORE	COMPUTED AVERAGE	TOTAL REPORTED BONUS POINTS
		W	95.490	96.490	0.00
REDACTED PURSUANT		W	103.836	108.836	10.00
TO PROTECTIVE ORDER		W	96.490	101.490	5.00

<u>APPENDIX C-2043</u>

INCONSISTENCIES FOR EXAM 2043

SOCIAL SECURITY NO	NAME	RACE/ ETHNICITY	AVERAGE SCORE	COMPUTED AVERAGE	TOTAL REPORTED BONUS POINTS
		W	100.369	95.369	0.00
		W	79.987	79.897	0.00
		W	93.066	93.053	0.00
		A	98.053	93.053	0.00
		W	84.428	87.697	0.00
		H	84.987	84.897	5.00
		H	79.987	79.897	0.00
		W	104.224	104.237	5.00
REDACTED PURSUANT		H	79.987	79.897	0.00
TO PROTECTIVE ORDER		B	79.987	79.897	0.00
		W	101.145	101.132	5.00
		W	84.987	84.897	5.00
		W	84.987	84.897	5.00
		H	84.987	84.897	5.00
		W	94.987	94.897	15.00
		W	79.987	79.897	0.00
		W	100.369	95.369	0.00
		W	84.987	84.897	5.00
		W	109.224	109.237	10.00
		W	94.669	94.657	10.00
		W	93.842	93.830	0.00
		W	99.224	99.237	0.00
		W	84.987	84.897	5.00
		W	94.987	94.897	15.00
		W	99.224	99.237	0.00
		B	84.987	84.897	5.00
		W	79.987	79.897	0.00
		W	84.987	84.897	5.00

APPENDIX C-7029

EXAM 7029 APPOINTMENT INCONSISTENCIES: APPT ON CID FILE AND NOT APP FILE

SSN	LAST NAME	FIRST NAME	APPTDATE	FIRST DISP	LAST DISP
			20030914	BLN	AOL
			20061119	NAC	BLN
			20030914	AOL	
			20050308		
			20040525	BLN	AOL
			20030914	TIE	AOL
			20040525	NAC	NAC
			20060411	NAC	NQA
			20050308	DEA	NAC
			20040912	DEA	
			20030914	NAC	AOL
			20050308		
			20030914	DEA	AOL
			20040307	AOL	
			20060115	NAC	FRI
			20060411	BLN	DEA
			20050308	NAC	
			20030914	AOL	
			20030914	BLN	AOL
			20061117	DEA	
			20030914	AOL	
			20020506	DEA	AOL
			20040912	DEA	AOL
			20050531	NAC	DEA
			20050308	BLN	NAC
			20041205	BLN	DEA
			20030914	BLN	AOL
			20050925	DEA	
			20060411	NAC	NQA
			20050925		
			20030914	AOL	
			20050925		
			20030914	BLN	AOL
			20030202	BLN	FTR
			20040307	AOL	
			20030914	AOL	
			20020127	BLN	AOX
			20050925	NAC	
			20041205	NAC	NQA
			20030504	BLN	FTR
			20030914	FRI	WVP
			20061119	DEA	
			20050308	NAC	NAC

REDACTED PURSUANT TO PROTECTIVE ORDER

APPENDIX C-7029

EXAM 7029 APPOINTMENT INCONSISTENCIES: APPT ON APP FILE AND NOT ON CID

SSN	LAST NAME	FIRST NAME	APPTDATE	FIRST DISP	LAST DISP
				BLN	APP
				NAC	APP
				APP	NQA
				APP	NQA
				APP	DEA
				BLN	APP
				TIE	APP
				APP	
				APP	DEA
				DEA	APP
				NAC	APP
				NAC	APP
				APP	
				APP	
				APP	
				APP	NQA

REDACTED PURSUANT TO PROTECTIVE ORDER

APPENDIX C-2043

EXAM 2043 APPOINTMENT INCONSISTENCIES: APPT ON CID FILE AND NOT APP FILE

SSN	LAST NAME	FIRST NAME	APPTDATE	FIRST DISP	LAST DISP
			20061119	BLN	DEA
			20050925	BLN	AOL
			20070325	BLN	AOL
			20061119	AOL	
			20050308	BLN	AOL
			20050531	NAC	NAC
REDACTED PURSUANT			20040912	NAC	AOL
TO PROTECTIVE ORDER			20060411	BLN	AOL
			20061119	AOL	
			20060611	NAC	AOL
			20061119	AOL	
			20061119	BLN	AOL
			20061119	AOL	
			20060611	BLN	AOL
			20061119	WVP	
			20061119	BLN	AOL
			20050308	BLN	AOL
			20050925	BLN	AOL
			20070805	NAC	AOL

APPENDIX C-2043

EXAM 2043 APPOINTMENT INCONSISTENCIES: APPT ON APP FILE AND NOT ON CID

SSN	LAST NAME	FIRST NAME	APPTDATE	FIRST DISP	LAST DISP
				BLN	APP
				BLN	APP
				APP	
				NQA	APP
				APP	
				BLN	APP

REDACTED PURSUANT TO PROTECTIVE ORDER

A P P E N D I X   D

FIREFIGHTER
EXAM. NO. 7029
EXPLANATION OF TEST SCORES

Congratulations, you passed the examination for Firefighter, Exam. No. 7029. You had to achieve a written test score of 84.705 or greater in order to be eligible to take the physical test part of this examination. In order to pass the physical test, you had to pass 6 out of the 8 physical test events (75%). You had to pass both the written and physical tests in order to pass the overall examination. The enclosed Notice of Result card includes the following test information:

Final Average (Part H)
Written Test Score (Part E)
Physical Test Score (Part U)
Residency Credit, if applicable (Part R)
Legacy Credit, if applicable (Part Y)
Veterans Preference, if applicable
Adjusted Final Average
List Number

I.   COMPUTING YOUR FINAL AVERAGE (Part H)

A.   Computing your Standardized Written Test Score

Your standardized written test score was computed by subtracting the average of all candidates' written test scores (91.230) from your written test score (Part E), and dividing the result by the standard deviation of the written test (9.308). Round the product to 5 decimal places. Note that your standardized written test score may be either a positive or a negative number.

B.   Computing your Standardized Physical Test Score

Your standardized physical test score was computed by subtracting the average of all candidates' physical test scores (87.262) from your physical test score (Part U), and dividing the result by the standard deviation of the physical test (15.582). Round to 5 decimal places. Note that your standardized physical test score may be either a positive or a negative number.

C.   Computing your Combined Weighted Standard Score

1.   Your Standardized Written Test Score was multiplied by the weight of the written test (.50) to produce your Weighted Standardized Written Test Score. Round to 5 decimal places.

2.   Your Standardized Physical Test Score was multiplied by the weight of the physical test (.50) to produce your Weighted Standardized Physical Test Score. Round to 5 decimal places.

3.   Your Weighted Standardized Written Test Score and your Weighted Standardized Physical Test Score were then added together to produce your Combined Weighted Standard Score. Round to 3 decimal places.

D.   Computing your Transformed Score

Your Transformed Score was computed by multiplying your Combined Weighted Standard Score by 18.472906403940886699 and rounding the product to 3 decimal places. The product was then added to 83.74384236453 and rounded to 3 decimal places to produce your Transformed Score.

E.   Computing your Final Average (Part H)

Your Final Average (Part H) was computed by adding your Residency Credit, if applicable (5 points) and Legacy Credit, if applicable (5 points) to your Transformed Score.

II.   COMPUTING YOUR ADJUSTED FINAL AVERAGE

Your Adjusted Final Average was computed by adding your Veterans Preference, if applicable (5 points for Veterans; 10 points for Disabled Veterans) to your Final Average.

B-000007

USA004935

EXAMPLE OF HOW TO COMPUTE YOUR ADJUSTED FINAL AVERAGE

Written Test Score (Part E) (50%)	Physical Test Score (Part U) (50%)	Residency Credit (Part R)	Legacy Credit (Part Y)	Veterans Preference
96.750	100.000	5.000	5.000	V

I.   COMPUTING YOUR FINAL AVERAGE (Part H)

A.   Computing your Standardized Written Test Score

Standardized Written Test Score = $\dfrac{\text{Written Test Score (Part E)} - 91.230}{9.308}$

Standardized Written Test Score = $\dfrac{96.750 - 91.230}{9.308}$ = 0.59304 (Round to 5 decimal places)

B.   Computing your Standardized Physical Test Score

Standardized Physical Test Score = $\dfrac{\text{Physical Test Score (Part U)} - 87.262}{15.582}$

Standardized Physical Test Score = $\dfrac{100.000 - 87.262}{15.582}$ = 0.81748 (Round to 5 decimal places)

C.   Computing your Combined Weighted Standard Score

1.   Weighted Standardized Written Test Score = Standardized Written Test Score x .50

Weighted Standardized Written Test Score = 0.59304 x .50 = 0.29652 (Round to 5 decimal places)

2.   Weighted Standardized Physical Test Score = Standardized Physical Test Score x .50

Weighted Standardized Physical Test Score = 0.81748 x .50 = 0.40874 (Round to 5 decimal places)

3.   Combined Weighted Standard Score = Weighted Standardized Written Test Score + Weighted Standardized Physical Test Score

Combined Weighted Standard Score = 0.29652 + 0.40874 = 0.705 (Round to 3 decimal places)

D.   Computing your Transformed Score

Transformed Score = (Combined Weighted Standard Score x 18.472906403940886699) (Round to 3 decimal places) + 83.74384236453

Transformed Score = (0.705 x 18.472906403940886699) (Round to 3 decimal places) + 83.74384236453 = 96.767 (Round to 3 decimal places)

D.   Computing your Final Average (Part H)

Final Average = Transformed Score + Residency Credit, if applicable + Legacy Credit, if applicable

Final Average = 96.767 + 5.000 + 5.000 = 106.767

II.   COMPUTING YOUR ADJUSTED FINAL AVERAGE

Adjusted Final Average = Final Average + Veterans Preference points, if applicable

Adjusted Final Average = 106.767 + 5 = 111.767

B-000008

USA004936

A P P E N D I X   E

FIREFIGHTER, EXAM. NO. 2043
EXPLANATION OF TEST SCORES

Congratulations. You have passed the examination for Firefighter, Exam. No. 2043. In order to have been eligible to take the physical test part of this examination, you had to achieve a written test score of 70.000 or greater. In order to pass the physical test, you had to pass 6 out of the 8 physical test events (75%). You had to pass both the written and physical tests in order to pass the overall examination. The enclosed Notice of Result card includes the following test information:

Final Average (Part H)
Written Test Score (Part E)
Physical Test Score (Part U)
Residency Credit, if applicable (Part R)
Legacy Credit, if applicable
Veteran's Preference, if applicable
Adjusted Final Average
List Number

I.   COMPUTING YOUR FINAL AVERAGE (Part H)

You must "round off" all calculations to 3 decimal places as indicated below.

A.   Computing your Standardized Written Test Score

Your standardized written test score was computed by subtracting the average of all candidates' written test scores (89.263) from your written test score (Part E), rounding to 3 decimal places, and dividing the result by the standard deviation of the written test (9.699). Again, round the product to 3 decimal places. Note that your standardized written test score may be either a positive or a negative number.

B.   Computing your Standardized Physical Test Score

Your standardized physical test score was computed by subtracting the average of all candidates' physical test scores (89.494) from your physical test score (Part U), rounding to 3 decimal places, and dividing the result by the standard deviation of the physical test (14.855). Again, round to 3 decimal places. Note that your standardized physical test score may be either a positive or a negative number.

C.   Computing your Combined Weighted Standard Score

1.   Your Standardized Written Test Score was multiplied by the weight of the written test (.50) to produce your Weighted Standardized Written Test Score.

2.   Your Standardized Physical Test Score was multiplied by the weight of the physical test (.50) to produce your Weighted Standardized Physical Test Score.

3.   Your Weighted Standardized Written Test Score and your Weighted Standardized Physical Test Score were then added together to produce your Combined Weighted Standard Score. Round to 3 decimal places.

D.   Computing your Transformed Score

Your Transformed Score was computed by multiplying your Combined Weighted Standard Score by 12.7226, then adding 88.4606 and rounding to 3 decimal places.

E.   Computing your Final Average (Part H)

Your Final Average (Part H) was computed by adding your Residency Credit, if applicable (5 points) to your Transformed Score.

II.   COMPUTING YOUR ADJUSTED FINAL AVERAGE

Your Adjusted Final Average was computed by adding your Veteran's Preference, if applicable (5 points for Veterans; 10 points for Disabled Veterans) and Legacy Credit, if applicable (10 points) to your Final Average.

B-000003

USA004931

EXAMPLE OF HOW TO COMPUTE YOUR ADJUSTED FINAL AVERAGE

Written Test Score (Part E) (50%)	Physical Test Score (Part U) (50%)	Residency Credit (Part R)	Legacy Credit	Veterans Preference
96.750	100.000	5.000	10.000	V

I. COMPUTING YOUR FINAL AVERAGE (Part H)

    A. Computing your Standardized Written Test Score

$$\text{Standardized Written Test Score} = \frac{\text{Written Test Score (Part E)} - 89.263}{9.699}$$

$$\text{Standardized Written Test Score} = \frac{96.750 - 89.263}{9.699} = 0.772$$

    B. Computing your Standardized Physical Test Score

$$\text{Standardized Physical Test Score} = \frac{\text{Physical Test Score (Part U)} - 89.494}{14.855}$$

$$\text{Standardized Physical Test Score} = \frac{100.000 - 89.494}{14.855} = 0.707$$

    C. Computing your Combined Weighted Standard Score

        1. Weighted Standardized Written Test Score = Standardized Written Test Score x .50

            Weighted Standardized Written Test Score = 0.772 x .50 = 0.386

        2. Weighted Standardized Physical Test Score = Standardized Physical Test Score x .50

            Weighted Standardized Physical Test Score = 0.707 x .50 = 0.354

        3. Combined Weighted Standard Score = Weighted Standardized Written Test Score + Weighted Standardized Physical Test Score

            Combined Weighted Standard Score = 0.386 + 0.354 = 0.740

    D. Computing your Transformed Score

    Transformed Score = (Combined Weighted Standard Score x 12.7226) + 88.4606

    Transformed Score = (0.740 x 12.7226) + 88.4606 = 97.875

    E. Computing your Final Average (Part H)

    Final Average = Transformed Score + Residency Credit, if applicable

    Final Average = 97.875 + 5.000 = 102.875

II. COMPUTING YOUR ADJUSTED FINAL AVERAGE

    Adjusted Final Average = Final Average + Veteran's Preference points, if applicable + Legacy Credit, if applicable

    Adjusted Final Average = 112.875 + 5.000 + 10.000 = 117.875

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